International Journal of American Linguistics

VOLUME XV NUMBER 4

A SET OF POSTULATES FOR THE SCIENCE OF LANGUAGE

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0. [Obituary, by the editor of IJAL]
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0. [The work of great men lives on. Whatever the future will accomplish in linguistics—even when Leonard Bloomfield's work itself is less frequently consulted—it will bear an enduring reflection of his character, of his genius for combining humanistic insight with scientific rigor, for achieving algebraic precision. Perhaps no single paper of his will exert a more seminal effect than the paper here reprinted.*

[Is it the duty of the young to bury their elders? Then we select for our text *A Set of Postulates*; and for our sermon silence.]

I. Introductory.

The method of postulates (that is, assumptions or axioms) and definitions[1] is fully adequate to mathematics; as for other sciences, the more complex their subject-matter, the less amenable are they to this method, since, under it, every descriptive or historical fact becomes the subject of a new postulate.

Nevertheless, the postulational method can further the study of language, because it forces us to state explicitly whatever we assume, to define our terms, and to decide what things may exist independently and what things are interdependent.[2]

Certain errors can be avoided or corrected by examining and formulating our (at present tacit) assumptions and defining our (often undefined) terms.[3]

Also, the postulational method saves discussion, because it limits our statements to a defined terminology; in particular, it cuts us off from psychological dispute.[4] Discus-

* From Lg. 2.153–64 (1926), with permission of the editor of Language whose obituary of Leonard Bloomfield, with bibliography, will appear in Lg. 25.87–98 (1949).

[1] For a clear exposition of this method, see J. W. Young, *Lectures on the Fundamental Concepts of Algebra and Geometry*, New York 1911.

[2] Cf. A. P. Weiss's set of postulates for psychology, *Psychological Review*, 32.83.

[3] Examples are many. Bopp took for granted that the formative elements of Indo-European were once independent words; this is a needless and unwarranted assumption. The last descendant of his error is the assumption that IE compound words are historically derived from phrases (Jacobi, *Compositum und Nebensatz*, Bonn 1897; this even in Brugmann, *Grundrisz* II², 1, pp. 37.78; cf. TAPA 45.73 ff.). The notion is gaining ground that some forms have less meaning than others and are therefore more subject to phonetic change (Horn, *Sprachkörper und Sprachfunktion*, Palaestra 135, Berlin 1921); I, for one, can discover no workable definition of the terms 'meaning' and 'phonetic change' under which this notion can be upheld. The whole dispute, perhaps today as unstilled as fifty years ago, about the regularity of phonetic change, is at bottom a question of terminology.

[4] Recall the difficulties and obscurities in the writings of Humboldt and Steinthal, and the psychological dispute of Paul, Wundt, Delbrueck. From our point of view, the last-named was wrong in denying the value of descriptive data, but right in saying that it is indifferent what system of psychology a linguist believes in (*Grundfragen der Sprachforschung*, Strassburg 1901). The trouble over the nature of the sentence is largely non-linguistic; contrast the simplicity and usefulness of Meillet's definition (adopted below), *Intro-*

sion of the fundamentals of our science seems to consist one half of obvious truisms, and one half of metaphysics; this is characteristic of matters which form no real part of a subject: they should properly be disposed of by merely naming certain concepts as belonging to the domain of other sciences.

Thus, the physiologic and acoustic description of acts of speech belongs to other sciences than ours. The existence and interaction of social groups held together by language is granted by psychology and anthropology.[5]

Psychology, in particular, gives us this series: to certain stimuli (A) a person reacts by speaking; his speech (B) in turn stimulates his hearers to certain reactions (C).[6] By a social habit which every person acquires in infancy from his elders, A-B-C are closely correlated. Within this correlation, the stimuli (A) which cause an act of speech and the reactions (C) which result from it, are very closely linked, because every person acts indifferently as speaker or as hearer. We are free, therefore, without further discussion, to speak of *vocal features* or *sounds* (B) and of *stimulus-reaction features* (A–C) of speech.

II. Form and Meaning.

1. Definition. An act of speech is an *utterance*.

2. Assumption 1. Within certain communities successive utterances are alike or partly alike.

A needy stranger at the door says *I'm hungry*. A child who has eaten and merely wants to put off going to bed says *I'm hungry*. Linguistics considers only those vocal features which are alike in the two utterances, and only those stimulus-reaction features which are alike in the two utterances. Similarly, *The book is interesting* and *Put the book away*, are partly alike (*the book*). Outside of our science these similarities are only relative; within it they are absolute. This fiction is only in part suspended in historical linguistics.

3. Def. Any such community is a *speech-community*.

4. Def. The totality of utterances that can be made in a speech-community is the *language* of that speech-community.

We are obliged to predict; hence the words 'can be made'. We say that under certain stimuli a Frenchman (or Zulu, etc.) will say so-and-so and other Frenchmen (or Zulus, etc.) will react appropriately to his speech. Where good informants are available, or for the investigator's own language, the prediction is easy; elsewhere it constitutes the greatest difficulty of descriptive linguistics.

5. Def. That which is alike will be called *same*. That which is not same is *different*.

This enables us to use these words without reference to non-linguistic shades of sound and meaning.

6. Def. The vocal features common to same or partly same utterances are *forms*; the corresponding stimulus-reaction features are *meanings*.

Thus a form is a recurrent vocal feature which has meaning, and a meaning is a recurrent stimulus-reaction feature which corresponds to a form.

7. Assumption 2. Every utterance is made up wholly of forms.

III. Morpheme, Word, Phrase.

8. Def. A *minimum* X is an X which does not consist entirely of lesser X's.

Thus, If X_1 consists of $X_2X_3X_4$, then X_1 is not a minimum X. But if X_1 consists of

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duction à l'étude comparative des langues indo-européennes,[3] Paris 1912, p. 339. I am indebted also to Sapir's book on *Language*, New York 1921, and to de Saussure's *Cours de linguistique générale*,[2] Paris 1922; both authors take steps toward a delimitation of linguistics.

[5] Cf. Weiss, l. c., p. 86: 'The language responses establish the . . . social type of organization . . . .'

[6] Cf. Weiss, *Journal of Philosophy, Psychology and Scientific Methods* 15.636: 'The significant thing about the speech reaction is that it may be either the adequate *reaction* to a situation, or it may be the adequate *stimulus* for either another speech reaction or some bodily reaction.'

X_2X_3A, or of X_2A, or of A_1A_2, or is unanalyzable, then X_1 is a minimum X.

9. Def. A minimum form is a *morpheme*; its meaning a *sememe*.

Thus a morpheme is a recurrent (meaningful) form which cannot in turn be analyzed into smaller recurrent (meaningful) forms. Hence any unanalyzable word or formative is a morpheme.

10. Def. A form which may be an utterance is *free*. A form which is not free is *bound*.

Thus, *book*, *the man* are free forms; *-ing* (as in *writing*), *-er* (as in *writer*) are bound forms, the last-named differing in meaning from the free form *err*.

11. Def. A minimum free form is a *word*.

A word is thus a form which may be uttered alone (with meaning) but cannot be analyzed into parts that may (all of them) be uttered alone (with meaning). Thus the word *quick* cannot be analyzed; the word *quickly* can be analyzed into *quick* and *-ly*, but the latter part cannot be uttered alone; the word *writer* can be analyzed into *write* and *-er*, but the latter cannot be uttered alone (the word *err* being, by virtue of different meaning, a different form); the word *blackbird* can be analyzed into the words *black* and *bird* and the word-stress ⊥ —, which last cannot be uttered alone (i.e., it differs in form and meaning from the phrase *black bird*).

12. Def. A non-minimum free form is a *phrase*.

E.g., *the book*, or *The man beat the dog*; but not, e.g. *book on* (as in *Lay the book on the table*), for this is meaningless, hence not a form; and not *blackbird*, which is a minimum free form.

13. Def. A bound form which is part of a word is a *formative*.

A formative may be complex, as, Latin verb-endings *-abat*, *-abant*, *-abit*, *-abunt*, etc., or minimum (and hence a morpheme), as Latin *-t* of third person.

14. Assumption 3. The forms of a language are finite in number.

IV. Example of a Special Assumption.

The phenomena of specific languages will no doubt necessitate further assumptions of form; and these will sometimes modify the general assumptions. The following is an example of such a special assumption.

Assumption S1. A phrase may contain a bound form which is not part of a word.

For example, the possessive [z] in *the man I saw yesterday's daughter*.

Def. Such a bound form is a *phrase-formative*.

This assumption disturbs the definition of *phrase* above given. Strictly speaking, our assumptions and definitions would demand that we take *the-man-I-saw-yesterday's daughter* as two words. Convenience of analysis makes an assumption like the present one preferable for English. A similar assumption might be convenient for the Philippine 'ligatures'.

V. Phonemes.

15. Assumption 4. Different morphemes may be alike or partly alike as to vocal features.

Thus *book* : *table* [b]; *stay* : *west* [st]; *-er* (agent) : *-er* (comparative). The assumption implies that the meanings are different.

16. Def. A minimum same of vocal feature is a *phoneme* or *distinctive sound*.

As, for instance, English [b, s, t], the English normal word-stress, the Chinese tones.

17. Assumption 5. The number of different phonemes in a language is a small submultiple of the number of forms.

18. Assumption 6. Every form is made up wholly of phonemes.

These two assumptions are empiric facts for every language that has been observed, and outside of our science are theoretical necessities (Boas, *Handbook of American Indian Languages*, Bureau of American Ethnology, Bulletin 40, vol. 1, pp. 24 ff.). Such a thing as a 'small difference of sound' does not exist in language. Linguists who believe that certain forms resist phonetic change, implicitly reject these assumptions,

though, so far as I can see, we could not work without them.

The morphemes of a language can thus be analyzed into a small number of meaningless phonemes. The sememes, on the other hand, which stand in one-to-one correspondence with the morphemes, cannot be further analyzed by linguistic methods. This is no doubt why linguists, confronted with the parallelism of form and meaning, choose form as the basis of classification.

19. Assumption 7. The number of orders of phonemes in the morphemes and words of a language is a sub-multiple of the number of possible orders.

20. Def. The orders which occur are the *sound-patterns* of the language.

As, English word-initial [st-] but never [ts-].

21. Def. Different forms which are alike as to phonemes are *homonymous*.

VI. Construction, Categories, Parts of Speech.

22. Assumption 8. Different non-minimum forms may be alike or partly alike as to the order of the constituent forms and as to stimulus-reaction features corresponding to this order.

The order may be successive, simultaneous (stress and pitch with other phonemes), substitutive (French *au* [o] for *à le*), and so on.

23. Def. Such recurrent sames of order are *constructions*; the corresponding stimulus-reaction features are *constructional meanings*.

This expands the use of the term *meaning*.

24. Def. The construction of formatives in a word is a *morphologic construction*.

Thus, *book-s*, *ox-en* have the construction of formative plus formative and the meaning 'object in number'.

25. Def. The construction of free forms (and phrase formatives) in a phrase is a *syntactic construction*.

Thus, *Richard saw John*, *The man is beating the dog* show the construction of free form plus free form plus free form meaning 'actor acting on goal'.

26. Def. A *maximum* X is an X which is not part of a larger X.

27. Def. A maximum construction in any utterance is a *sentence*.

Thus a sentence is a construction which, in the given utterance, is not part of any larger construction. Every utterance therefore consists of one or more sentences, and even such utterances as Latin *pluit*, English *Fire!* or *Ouch!* are sentences.

28. Assumption 9. The number of constructions in a language is a small sub-multiple of the number of forms.

29. Def. Each of the ordered units in a construction is a *position*.

Thus the English construction of formative plus formative meaning 'object in number' has two positions; and that of free form plus free form plus free form meaning 'actor acting on goal' has three positions.

30. Assumption 10. Each position in a construction can be filled only by certain forms.

Thus, in the English construction of formative plus formative meaning 'object in number' the first position can be filled only by certain formatives (noun-stems), and the second only by certain other formatives (affixes of number, such as the plural-sign *-s*). And in the English construction of free form plus free form plus free form meaning 'actor acting on goal' the first and third positions can be filled only by certain free forms (object expressions) and the second only by certain other free forms (finite verb expressions). This assumption implies the converse, namely, that a given form will appear only in certain positions of certain constructions. Thus, an English noun-stem will appear only in the first position of the construction 'object in number', in the second position of the construction formative plus formative meaning 'object having such an object' (*long-nose*), and in certain positions of a certain few other constructions. Similarly, an object expression, such as *John*,

the man will appear in the first position of the construction 'actor acting on goal', or in the third, or in certain positions of a certain few other constructions.

31. Def. The meaning of a position is a *functional meaning*.

That is, the constructional meaning of a construction may be divided into parts, one for each position; these parts are functional meanings. It would be more concrete, but perhaps less useful, if we said: the meaning common to all forms that can fill a given position, when they are in that position, is a functional meaning. Thus, in the English construction of 'object in number' the first position has the functional meaning 'object', or, more concretely, all the formatives (noun-stems) which can occur in this position, have in common, when they so appear, the functional meaning 'object'. And in the English construction of 'actor acting on goal' the first position has the functional meaning 'actor', or, more concretely, all the free forms (object-expressions, such as nouns, noun-phrases, pronouns, etc.) which can occur in this position, have in common, when they so appear, the functional meaning 'actor'. And in this same construction, the third position has the meaning 'goal', or, more concretely, all the free forms (largely the same as those just mentioned) which can appear in this position, have in common, when they so appear, the meaning 'goal'.

32. Def. The positions in which a form occurs are its *functions*.

Thus, the word *John* and the phrase *the man* have the functions of 'actor', 'goal', 'predicate noun', 'goal of preposition', and so on.

33. Def. All forms having the same functions constitute a *form-class*.

Examples of English form-classes are: noun-stems, number-affixes, object expressions, finite verb expressions.

34. Def. The functional meanings in which the forms of a form-class appear constitute the *class-meaning*.

Thus, the meanings found in all the functions of the form-class of English object expressions, namely 'actor', 'goal', etc. (§32) together constitute the class-meaning of these forms, which may be summed up as 'numbered object' or in the name 'object expression'.

35. Def. The functional meanings and class-meanings of a language are the *categories* of the language.

Thus, the above examples enable us to determine the following categories of the English language: from functional meanings: object, number, actor, action, goal; from class-meanings: object, number, numbered object (object expression), predicative action (finite verb expression).

36. Def. If a form-class contains relatively few forms, the meanings of these forms may be called *sub-categories*.

Thus, the English category of number contains only two meanings, singular-indefinite (*egg*) and plural (*eggs*). Hence one may speak of the sub-categories of singular and plural; it is convenient to do so when, as in this case, the sub-categories play a part in the alternation of other forms (see VII).

37. Def. A form-class of words is a *word-class*.

38. Def. The maximum word-classes of a language are the *parts of speech* of that language.

VII. Alternation.

39. Assumption 11. In a construction a phoneme may alternate with another phoneme according to accompanying phonemes.

As in Sanskrit sandhi: *tat pacati, tad bharati*.

40. Def. Such alternation is *phonetic alternation*.

41. Assumption 12. In a construction a form may alternate with another form according to accompanying forms.

As, in English, the plural affixes *book-s* [s], *boy-s* [z], *ox-en*, *f-ee-t*. Or, verbs: *He skates, They skate*, according to number of actor.

42. Def. Such alternation is *formal alternation*.

43. Assumption 13. Absence of sound may be a phonetic or formal alternant.

44. Def. Such an alternant is a *zero element*.

The postulation of zero elements is necessary to Sanskrit (Pāṇini 1, 1, 61), for Primitive Indo-European (Meillet, *Introduction à l'étude comparative des langues indo-européennes*[3], Paris 1912, p. 127 f.), and probably economical for English (singular *book* with affix zero, as opposed to *book-s*, cf. *f-oo-t* : *f-ee-t*).

45. Def. If a formal alternation is determined by the phonemes of the accompanying forms, it is an *automatic alternation*.

Thus, the alternation of [-s, -z, -ez] in the regular English plural suffix of nouns is automatic, being determined by the final phoneme of the noun-stem. This differs from phonetic alternation since not every [s] in English is subject to this alternation, but only the (four) morphemes of this form. Similarly, Sanskrit *tat pacati* : *tan nayati*, since the alternation takes place only in wordfinal (contrast, e.g. *ratnam*).

The phonetic alternations and the automatic formal alternations of a language allow of a classification of the phonemes, to which the sound-patterns (§20) may contribute. Thus, the regular English plural suffix implies a classification of those English phonemes (the great majority) which may occur at the end of a noun-stem into the classes (1) sibilant, (2) non-sibilant (*a*, unvoiced, *b*, voiced). Ordinary phonetics can go no farther than this; phonetics which goes farther is either a personal skill or a science for the laboratory.

46. Def. The classification of phonemes implied in the sound-patterns, phonetic alternations, and automatic formal alternations of a language is the *phonetic pattern*.

For the sound-patterns and phonetic pattern see Sapir, *Language*, 1.37, and cf. Baudouin de Courtenay, *Versuch einer Theorie Phonetischer Alternationen*, Strassburg 1895.

47. Def. If formal alternation is otherwise determined, it is *grammatical alternation*.

As, English plural suffix *-en* in *ox-en* alternating with the regular suffix above described; the verb-forms in *he skates*: *they skate*.

48. Def. If the accompanying forms which determine one grammatical variant predominate as to number, this variant is said to be *regular*; the others are irregular.

Thus *-en* is an irregular plural suffix.

49. Def. If in a construction all the component forms are irregular, the whole form is *suppletive*.

If *go* be taken as the stem of the verb, then the past *went* is suppletive. Under this definition *better* as comparative of *good* would not be suppletive, since the ending *-er* is regular; a definition that will include such forms can be made only within English (or Indo-European) grammar, after 'stem' and 'affix' have been defined for this language.

50. Def. Whatever has meaning is a *glosseme*. The meaning of a glosseme is a *noeme*.

Thus the term glosseme includes (1) forms, (2) constructions, (3) zero elements.

The assumptions and definitions so far made will probably make it easy to define the grammatical phenomena of any language, both morphologic (affixation, reduplication, composition) and syntactic (cross-reference, concord, government, word-order), though I cannot say whether any such further definitions would apply to all languages. Other notions, such as subject, predicate, verb, noun, will apply only to some languages, and may have to be defined differently for different ones,—unless, indeed, we prefer to invent new terms for divergent phenomena.

VIII. Historical Linguistics.

The following assumptions and definitions for historical linguistics are added for the sake of completeness. Insofar as they are correctly formulated, they will merely restate the working method of the great majority of linguists.

51. Assumption H1. Every language changes at a rate which leaves contemporary persons free to communicate without disturbance.

The ways in which it changes are described in Assumptions H3 and following.

52. Assumption H2. Among persons, linguistic change is uniform in ratio with the amount of communication between them.

These two assumptions and the assumptions and definitions based on them are necessarily loose, not because the process is too slow for any methods of direct observation that have been used—assumptions could ignore this—but because in historical linguistics it is our purpose to envisage the phenomena as relative. Ultimately no two speakers, and indeed no two utterances, have the same dialect: our assumptions must leave us free to examine the historical process with any desired degree of detail.

53. Def. If linguistic change results in groups of persons between which communication is disturbed, these groups speak *dialects* of the language.

54. Def. A relatively uniform auxiliary dialect used by such groups is a *standard language*.

55. Def. If linguistic change results in groups of persons between which communication is impossible, these groups speak *related languages*.

56. Assumption H3. Phonemes or classes of phonemes may gradually change.

For 'classes of phonemes' see §§45, 46.

57. Def. Such change is *sound-change*.

This assumption, by naming phonemes, implies that meaning is not involved. Owing to the assumptions that limit the number of phonemes (Assumptions 5 and 6), the change must affect the phonemes at every occurrence and do away with the older form of any phoneme that is changed.

58. Assumption H4. Sound-change may affect phonemes or classes of phonemes in the environment of certain other phonemes or classes of phonemes.

59. Def. This change is *conditioned sound-change*.

60. Assumption H5. Sound-change preponderantly favors shorter forms.[7]

61. Assumption H6. Linguistic change may substitute sames for differents.

62. Def. This change is *analogic change*.

63. Def. Analogic change which creates or enlarges a glosseme is *contamination*.

For example, creation (of a morpheme), pre-Germanic **hweðwōrez* 'four', **fimfe* 'five' > **f-eðwōrez*, **f-imfe*. Increase in size (of a morpheme), late Latin *gra-ve*, *le-ve* > *gr-eve*, *l-eve* (Italian).

64. Def. Analogic change which extends the use of a glossemė is *adaptation*.

Late Latin *reddere* > *rendere*, extending to a new word the morpheme *-end-* of *prendere*, *p-endere*, *att-endere* (*v-endere?*).

65. Def. Adaptation which replaces one alternant by another is *proportional analogy*.

English *bēc* > *book-s*; the plural affixes vary according to the accompanying noun-stem (grammatical alternation, §41), and now one alternant replaces another. The diagram showing the proportional character is familiar.

66. Def. Analogic change of formatives is *formal analogy*.

It may of course be contamination, adaptation, or proportional analogy. In a language in which stems and affixes are definable, it is customary to distinguish between 'material' formal analogy (affecting stems) and 'grammatical' formal analogy (affecting affixes).

67. Def. Analogic change of words is *semantic change*.

It may of course be contaminative, adaptive, or proportional. E.g., English *meat* 'pabulum' > 'caro'; or *home* 'Heim' > 'Haus'. Probably proportional:

He left the bones and took the flesh: He left the bones and took the *meat*::

[7] Assumptions H5 and H7 try to embody the results of Jespersen's *Progress in Language*, New York 1894.

She cooked the beans with the flesh: She cooked the beans with the **meat.**

They have a lovely house: They have a lovely *home* (intensive)::

A fine new house for sale: A fine new **home** for sale (intensive).[8]

68. Assumption H7. Analogic change predominantly disfavors irregular glossemes and those which diverge from their fellows; it tends to disfavor them in inverse ratio to their frequency of occurrence.

This is necessarily vague, because we know little about replacement and obsolescence through such factors as unusual homonymy, word-tabu, and other deviations of glossemes, that is, about inadequacy of glossemes and its effect. Cf. Gilliéron, *Pathologie et thérapeutique verbales*, Collection linguistique, vol. 11, Paris 1921.

[8] The word 'intensive' is meant merely to describe the meaning of *home* in its new use (intensive of *house*), and is not meant as a technical term. Cf. also Kroesch, LANGUAGE 2.35–45 (1926).

69. Assumption H8. Whoever speaks a foreign language or dialect may in it substitute resemblant features of his native speech.

70. Def. This is *linguistic substitution.*

71. Def. Linguistic substitution of phonemes is *sound-substitution.*

72. Assumption H9. Whoever hears a foreign language or dialect may adopt features of it into his own speech.

73. Def. Such adoption is *linguistic borrowing.*

74. Def. Borrowed words are *loan-words.*

75. Assumption H10. The phonemes of analogic forms and loan-words may be changed so as to fit the sound patterns of the language.

Western European *peregrinus* > *pilgrim*; German *klüppel* > *knüppel.*

76. Def. Such change is *sudden sound-change.*

77. Assumption H11. Glossemes may go out of use.

Compare the comment on Assumption H7, §68.

SHOSHONE II: MORPHEME LIST[1]

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7. Morpheme List. The list below includes all morphemes which have been isolated in the text. Their order follows that of the phonemes, namely: zero, a, a:, i, i:; ī, ē; ɔ, o, o:; u; b, p, (w), -β-, -ɸ-, -Pø; d, t, d', -r; g, k, k'; g^w-, -k^w, -h^w-, -x^w; h-, -h-, -x; m-, -w-, m̥-; n, ŋ, n̥-, ŋ̊-; s, š, -z-; ʒ, -ǯ, c, -č; w, W; and y. Prefixes and basic stems precede suffixes within the same phoneme group. Every instance in which a given morpheme occurs within the text has been noted by the corresponding word number. In addition, frequent usages and related stems not illustrated in the text have been given in the morpheme list whenever appropriate.

ZERO

- no suffix, with the final vowel of a verb usually dropped: *present tense, indefinite aspect* (124, 138, 145, 184, 186, 203, 207, 220, 223, 262, 265, 489, 500).

- no suffix, without dropping of the final vowel of the verb stem in most cases: *singular imperative* (24, 252, 291, 320).

-(i)- no suffix, although an -i- glide vowel usually added to the stem: *nouns, verbal nouns and adjectives in the absolute which have been defined by an article or by a preceding noun or pronominal demonstrative in the absolute* (67, 70; 242, 244, 245; 314; 442, 443; also, probably 53, 54). See also -t.

a

anda- *in the opposite direction or way, away from* (321, 391); cf., also, a'ndapunt *otherwise, other than,* na'nadapunt *in every way.*

ani- *downward* (305); cf., also, a'niwu'i *housefly* (*downward-sees*); anī- (verb) *to fall.*

a'nīŋg^wak^{w}a *Yellow Throat* (*Geothypis trichos*?) (212, 216, 228).

-a *nominal suffix indicating objective-genitive case in nouns and adjectives and, derivatively, relative usage in pronominal demonstratives* (6, 79, 174, 196, 227, 282, 288, 334, 376, 378, 383, 389, 428).

-an *verbal suffix of past perfect tense* (51, 287; 326, in syncopated form).

-(a)s *verbal suffix of past participial meaning* (96; 102, with o substituted for a in accordance with vocalic harmony in the stem goto- *to make a fire*). Note also the past perfect participial suffix -mas *having finished* (*an action*).

-(a)c alternate form of -(a)s (257, 293, 299, 369, 390, 392, 393, 485). This second form is more common, but the basis of difference in usage of the two forms is not known, excepting that -ac is always used after the past tense suffix -k^{w}or -x^w while -as is always used after the completive suffix -ma-.

-ac *intensive suffix of nouns, pronouns and demonstratives,* probably <-ʒa *well, indeed, surely* (75, 165, 221). Note nī'ʒa, nī:c, nī'rac, all meaning *I, indeed*; the -r- in the last illustration is the absolute suffix as in 165, 221. Note also dĕ'ac *and surely,* contrasting with the simple conjunction dĕ'as *and, also.*

a:

a:- *demonstrative prefix denoting great distance* (113, 121); cf., also, a:t' *a great distance,* a:β^i *far outside, far below.*

i

i- *demonstrative of proximity* (*this, here*) (381, 514); cf., also the demonstrative verb ik *here is,* i'wait *in this way.*

iβ^i *nearby outside, down here* (514); note a:β^i *far below.*

i'ǯapĕ *Coyote* (*Canis lestes, C. nebracensis*) (6, 9, 12, 16, 27, 60, 65, 169, 226, 280, 310, 317, 329, 354, 400, 411, 416, 422, 424, 434, 448, 451, 471, 504, 513); note also pi'a iǯapĕ *wolf* (*Canis nubilus*), i'ǯapiŋgĕn (*he*)

[1] For Shoshone, I: Linguistic Sketch and Text, Sections 1 to 6, see IJAL 15.175–188 (1949).

deceives. The word is a crystallized compound <iʒa- + -pë personalizing suffix, cf. cu'gupë *old man*. An alternative form of the stem, iš(a)-, *Coyote-, false-*, is used in composition, cf. i'šawë *Coyote's Penis* (*Washakie's Needle*), i'šat (*a*) *lie*.

išiʒa *this is good* (314), <iš demonstrative verb *this is* + i (glide) + ʒa *good*; note also išɱbeš *this is all*.

i'yai- (*to*) *watch, look out for* (320, 330). Generally used with the prefix gu, of unknown meaning, as in gu'iawap *scout*.

-in, -īn, -ën *verbal suffix of present tense, moderately continuing aspect*)8, 10, 14, 17, 23, 44, 63, 66, 74, 76, 91, 180, 312, 315, 341, 345, 347, 360, 379, 402, 405, 444, 506, 510, 516).

i:

i:[ɬ]! meaningless sound representing the escape of insects (462).

ĭ, ĕ

ĕgĕ- *adjectival/adverbial prefix of inception* (*immediately, as soon as, now*) (46, 499); cf., also, ĭ'gači'a *henceforth*, ĕ'gĕtiʒa *right away indeed*, ĕ'gĕš *right here are or is*—(demonstrative verb).

ĕ-, ĕnĕ- *objective/genitive second person singular pronominal prefix* (*your, to you*) (177, 193, 209, 250, 253, 290, 331, 332, 380).

ĕn, ĕnënt *absolute forms of second person singular pronoun* (*you*) (19, 221, 250, 252, 254, 292, 366, 368). The presence or absence of the absolute suffix -(n)t apparently involves no change in meaning.

-īn, -ën See verbal suffix -in.

-īn *partitive nominative suffix* (*amongst*) (283, 452, 487); note also such constructions as si'wundīnʒa pënt *indeed among these places seen*; pë'mëde:dīndu'ax *among your children as they are born*. Compare the indefinite partitive suffix -xasai, e.g., da'mĕxasai *any one of us*.

-ës *suffix of emphatic mood in objective case of nouns, and in adverbs; secondarily, reflexive of personal pronouns* (131, 139, 177, 181, 193, 209, 217, 442, 463). This appears to be a loosely attached suffix, probably related to the suffix/demonstrative -us, us *it is, that is*.

ɔ, o

ɔha-, ɔ'haβit prefixed and independent forms of the adjective, *yellow* (13, 38).

ɔ'yɔ- *all* (40, 51, 107, 237).

o:-

o:gi plural verb, (*to*) *assemble, congregate* (104, 359).

u-

u- (*Strictly*) *third-person, singular, invisible objective/genitive prefix*; (*loosely*) *an undefined object, singular or plural, it, that, they* (17, 28, 88, 97, 110, 123, 132, 134, 140, 142, 148, 150, 154, 156, 161, 164, 180, 183, 191, 202, 207, 213, 219, 229, 233, 241, 261, 265, 274, 285, 287, 306, 312, 315, 321, 325, 326, 333, 336, 339, 346, 347, 349, 360, 364, 370, 371, 375, 379, 383, 386, 389, 391, 396, 402, 405, 447, 467, 478, 479, 482, 485, 489, 492, 493, 127).

urë- *third-person, plural* (*probably, also dual*), *invisible objective/genitive prefix* (10, 14, 46, 52, 84, 91, 170, 248, 267, 355, 393, 412, 419, 454, 456, 458, 459, 474).

uk, uk- *indefinite locative "there"* (*without necessary reference to invisibility*) (79, 94, 486). Suffixation of the genitive, -a, yields a relative meaning, *there where*, while suffixation of the abstract—(u)r, a directional meaning, ukur *thither*; note also makar *hither*, u'kux *within there*.

us, -us *demonstrative verb, that is, that is it; as a suffix, used for emphasis, (thus)—it is* (204, 234, 250, 277, 511). See also -ës.

b, p, (w), -β-, -ɸ- -pɸ-

bamb[i] *head* (436, 438).

be-, -βe-, -we- adverbial prefix, *already* (57, 324, 340, 395, 406, 413); used most commonly as the adverbial verb beš *already is*, but also in many idiomatic forms, su'βe *then*, be'čux *tomorrow, in the morning*, be'čuxus *early in the morning*, so:'weš *long ago*, na'βeš *together, at the same time*, su'βegant *enough*, ke'ped (*for*) *a little while*, hĭ'mbegant? *how much?*

beka'- verbal stem, (*to*) *kill*, derivatively, (*to*) *fight* (80, 88, 233, 333); compare ʒaka'- (*to*) *break off*, wëka'- (*to*) *cut down*.

pa'sia *Bald Eagle* (*Halaectus leucocephalus leucocephalus*) (130).

pa:'saga- *slush* (515); full etymology uncertain, <pa:- *water*.

pi-, -βi- adverbial prefix, *by means of the buttocks, behind* (370); cf., also, pi'nank^{w} independent preposition, *behind*, na'βita *backward*, pi'šu- (*to*) *break wind*.

pi'a-, pi'či(-), pi'βiči adjectival prefix, *big* (33, 56, 120, 477, 482). The form pi'či <pi'a+-či *independent adjectival suffix* (distributive, *all big*, formed by initial CV- reduplication, pi'βiǯi) is rarely used as a prefixed form as in word 33. It should be noted that, with other adjectival forms that use both the bare stem and the suffixed stem as a prefix, a change in meaning can usually be noted, cf. di'a- *fearful*, di'či *bad*. Note also pi'asuant *rather large*, pi'ant *very large*.

pi'ag^{w}ęa Eagle (species unidentified) (120); <piá *big*+ -g^{w}ęa *bird*.

pë''a verbal stem, (*to*) *leave behind* (419); also, (*to*) *leave alone, let go*, as in nëǯi'pë'a!—*Release that pointed stick from me!* <nëme + -ǯi- *by means of a sharp point* + -pë'a.

pi'čipiβit *Big Horsefly* (*unidentified*) (33).

pi'βit *Horsefly, Horseflies* (*abstract*) (32, 33, 35, 37, 39). Crystallized compound <pi'βi + -t *absolute nominal suffix*, not encountered in other forms.

bika'- verbal stem (*to*) *make a noise* (267, 302).

pë(n)- *third personal, singular, reflexive pronoun* (83, 85, 131, 146, 179, 181, 217, 313, 332, 362, 424, 428, 429, 441, 505, 509). Note also the *intensive reflexive suffix* -ës used in conjunction with pë-, as in 131, etc. The *third personal, dual, reflexive pronoun* is pëxë-, which is also the *second personal genitive/accusative pronoun*. Similarly, pëmë- is used for both the *third personal plural, reflexive pronoun* and the *second personal genitive/accusative*.

pi'di- verbal stem, (*to*) *arrive* (8, 23, 44, 46, 70, 84, 124, 141, 149, 155, 162, 184, 186, 203, 220, 223, 262, 265, 295, 307, 314, 341, 372, 394, 510); note the various derivative verbs, e.g., ë'gëβïdi- (*to*) *immediately upon arrival* (46) gariβïdi- (*to*) *alight* (124, etc.); pï'diβïdi- (*to*) *arrive and be present*. The type of iteration represented by the total reduplication of the verbal stem often leads to changes in meaning, e.g. uwïtï'g^{w} (he) *hit him*, wïtï'g^{w} awïtïg^{w} (he) *tumbled*.

pëti'yu adjective, *heavy* (166); actually a verbal form with the rare suffix, -a'^{yu} *present perfect tense*. The stem pëti'- appears to be a crystallized compound, cf. pïšu'- (*to*) *drag* (*something*).

pë'rha- verbal stem, (*to*) *burst* (492).

pë'më-, pë'mën- *second personal, plural pronoun* (111, 165); also, *third personal, plural, reflexive pronoun*. The *second person dual* is pëx-, pë'xë-.

pë'ni'- adverbial prefix, *just as* (424). Apparently a crystallized compound; compare suni'hac *furthermore*, suni'yï'g^{w}ït *finally*; also, -pë'xa *pluperfect comparative suffix*, as in pënt ŋdï'kapëxa *the place where* (*he*) *had eaten before*.

pënt (pëŋk) nominative absolute and, in parenthesis, accusative/genitive absolute, forms of the noun, *place* (18).

pɔ'kɔ *Burrowing Owl* (*Speatyto cunicularia hypogaea*) (173, 190, 205).

buβ: meaningless sound representing the noise of a humming bird (258).

-p, -β, -β- *passive participial suffix* (36, 38, 159, 498). It is possible that this may rather be the abstract suffix -βi (cf. dɔ'ya *mountain*, dɔ'yaβi *mountain range*) in the first three cases.

-βa, -ba prepositional suffix, *upon* (115, 123, 132, 140, 148, 154, 161, 183, 202, 219, 261, 294, 306, 313, 371, 452, 456); used more rarely as an instrumental suffix, *by means of* (232) or *for the purpose of*, cf., ïs në ga'nhiβa' ïn[1] *this is what I have for a house*.

-bandam emphatic instrumental suffix, *indeed, by means of-* (316).

-βič, -wič *nominal suffix of animate being* (4, 153, 160, 334). Some indication exists that masculine gender is implied, cf., pa:'nɜo'aβič *Water Ghost Being*, pa:'nɜo'ahiβia *Water Ghost Woman*.

-pë *nominal suffix denoting persons* (always

singular) (6, 9, 12, 16, 27, 60, 65, 169, 226, 276, 280, 310, 317, 329, 354, 400, 411, 418, 422, 424, 434, 448, 451, 471, 504, 513). In the dual and plural, the prefix is usually dropped, cf. de:'pĕr *child*, dĭre'd *children*; cu'gupë, *old man*, cu'cugu'ë *old men*; tų'iapë *boy*, pi'hianux *two boys*, pi'hianē *boys*. Note also wai'pē *woman*, wai'pënē *women*.

-§ui- *verbal suffix of durative action* (458).

d, t, d', -r

da-, (dë-) prefix indicating an indefinite, vague object of the verbal stem, "*something*" (*changes transitive verbs to impersonals*), (341, also 454, 458, 461, 464?). Note also dawu'-pšurap *something dragged by a rope*, mę da nï'g^{w}ïn *that's what they (people in general) say*, ke dëna'ŋgant *he who won't listen*.

dakē'- verbal stem, (*to*) *ooze* (458, 461, 464).

dakï'ši- verbal stem, (*to*) *smash* (454).

teg^{w}a- verbal stem, (*to*) *announce*, (*to*) *act as a chief* (10, 14, 66).

da'mē-, (damen-), -ram', -dam *first personal, inclusive pronominal prefix and pronoun* (we, our) (80, 81, 86, 95, 231, 243, 406, 468) Note also the *first personal, inclusive dual pronominal prefix*, da'-, and *pronoun*, daux.

dasu''a verbal stem, (*to*) *claw at* (186, 207, 223, 265).

da'ʒak^{w}a verbal stem, (*to*) *pick one's way* (516). Noted only in this stereotyped expression.

deč *brother-in-law, man's sister's husband* (175).

taw(a)- verbal stem, (*to*) *tie, fasten* (384, 386, 390, 396).

de:- adjectival prefix, *small, childish* (239, 282, 362, 428, 452).

(de:'či), dĭre'tĭci *singular and distributive (plural) forms of the independent adjective/adverb, little* (239, 282).

(de:'pĕr), dĭre'd *singular and distributive (plural) forms of the noun, child, children* (362, 428, 452).

da:'βeʒg^{w}asaβa *Speckle-Breasted Hawk* (*Falco sp.*) (197).

da:ni- verbal stem, (*to*) *knock down* (127, 134, 142, 150, 156, 164).

(diβi-), di'βiži prefixed and independent forms of the adverb, *very much* (251, 263, 273).

di'a- verbal stem, (*to*) *die*; hence derivative na'riand *dangerous* (41), di'či- *bad*, and probably dë:''iya- *to fear*.

di'βižimətoxa *Humming Bird* (*Selasphorus platycercus*) (251, 273).

dë'as conjunction, *and, also* (137, 144, 152, 158, 163, 222, 227, 385). Note also dë'ac *and surely*, dë'agëa *and maybe will*.

diβi- verbal stem, (*to*) *ask* (17, 91, 405).

dïka'- verbal stem, (*to*) *eat* (138, 145). Probably a crystallized compound, cf. dïku'-mba, wïku'mba *club* (wï- *by means of blows*, kumba- verbal stem, *to kill*), also wïka'- *to cut down*.

dïku'mba club (441) See dïka- above.

tï'nzant *Prairie Dog* (*Cynomys leucurus*).

dɔ''i- verbal stem, (*to*) *enter, or to come out*; derivatively, *to advance* (408, 416).

dɔ'ra- verbal stem, (*to*) *find* (287).

dog^{w}a *Rattlesnake* (*Crotulus confluentus*) (138).

do'g^{w}arïka *Vulture* (*unidentified*) (138).

(dɔ'ša-), dɔ'šaβit prefixed and independent forms of the adjective, *white* (159).

dɔ'šaβit mumbič *White Owl* (*unidentified*) (159–160).

(du''a), du'ru'a singular and distributive forms of the noun, *son, sons* (484); with the reflexive-distributive prefix, na'nadu'a *father-and-son*. Also used verbally, cf., du'ačux^{w}ac *after having been born*.

tų''i- adjectival prefix probably meaning *young*; met only in the words tų''iwiči *youth* (4, 334) and tų''iapē *boy*.

dug- See -duk.

(du:-), tu'huβit prefixed and independent forms of the adjective, *black* (36); note also du:'k^{w}asu *soldier* (*black clothes*), du'gan *night*.

-d, -t, -r, -(i)t, -(n)t the various forms and meanings of this old Uto-Aztecan absolute nominal suffix are extensive and difficult to

formulate accurately. (1) It nominalizes verbs and adjectives (21, 34, 36, 38, 40, 41, 70, 241, 259, 284, 285, 314, 330, 357, 362, 363, 428, 442, 452, 487, 501). The form -d, -t is the most common, the suffix -r being largely restricted to certain verbs of action (*go, come, pack,* mia-, gim-, no:-) and the suffix -nt being largely restricted to verbs of the mind (*think, see, watch,* -su-, wu-, i'yai-). (2) It abstracts a noun, making it a logical plural and grammatical singular (especially 31–44, where the singular rather than the distributive form of the verb is used; the use of the distributive in apposition, 41, emphasizes that *all* are dangerous. Also, 108–110; 112–116; 237–241; 242–245; 281-284; 483–485; 489). (3) It denotes the nominative case in all instances (-k replacing -t in the *objective,* -(zero) when *in construct with a preceding abstract or otherwise defined*). (4) Suffixed to a personal pronoun it apparently introduces no change in meaning (165, 221, 252, 254, 292, 368). The forms nīt *I* and pë'xënt *you two* have also been noted, but are rare. (5) Suffixed to the demonstrative su- *there* and si- *here,* it indicates the singular subject of the sentence or clause. The form -r is always used with su-; -t, with si-. (1, 11, 26, 58, 64, 67, 71, 90, 105, 117, 125, 128, 135, 143, 151, 157, 168, 171, 188, 195, 199, 211, 214, 225, 235, 255, 271, 275, 278, 286, 296, 303, 308, 316, 318, 323, 327, 338, 342, 353, 374, 377, 387, 398, 404, 410, 417, 421, 426, 432, 439, 446, 449, 460, 466, 470, 490, 502, 507). (6) Suffixed to the plural pronominal demonstratives (su'rë *they, those*; si'dë *they, these*), it verbalizes them to the meaning *those (these) who are-* (31). (7) Suffixed to demonstratives (uk-, suk-, mak-) it lends them a directional meaning, cf. uk *there,* ukur *thither* (94, 101, 486). Note also su'tunt *around there,* si'tunt *close by.* (8) Note also the verbal suffix -nt.

-dak nominal and pronominal exclusive suffix, *only* (251, 253, 324).

-ram see damë-.

-daw- conative verbal suffix, *tried to* (127, 134, 142, 150, 156, 164).

-rë, -dë suffix of the pronominal demonstratives, su- *there,* and si- *here,* respectively, indicating a plural subject; also, indicates plurality in the third person visible (marë-) and invisible (urë-) pronouns. (10, 14, 29, 31, 46, 48, 52, 53, 84, 98, 248, 267, 268, 332, 393, 412, 414, 419, 454, 456, 458, 459, 463, 469, 474, 475, 480, 497).

-dë'^{i}, -rë'^{i} verbal suffix, *future tense* (80, 82, 97, 295, 372, 384, 386, 408, 454, 469).

-dīk verbal suffix, *inceptive aspect* (*just, barely, lightly*) (315). Note ya'gaitīgix *begins to cry,* ga'tīgīn *barely sitting*; compare the suffix of the immediate past -dī'gi, cf. mi'arīgi *just gone,* and the anticipatory suffix -dɔ'ix, cf. pënigu'tidɔ'ix *when (he) is about to shoot.*

-duk *emphatic modal suffix, and, more rarely, prefix of nouns and pronouns, indeed* (231, 243, 253, 331).

g, k, k'

ke negative particle, *no, not* (230, 242, 301, 311, 401).

ke han *interrogative* (*literally, no- yes*) (401). Other compounds of the negative include ke ǯant *not good, bad*; ke mu'gagant *branchless*; keši *not yet,* ke'šis *almost* (compare beš *enough, already*); ke''īmp *not at all* (compare su'βe'īmp *from then on*); ke'ped *a little while.* Note also the interrogative suffix -ŋgīš *maybe,* cf. ë'nëŋgîš *maybe you?*

ke -wai the negative particle at the beginning of the clause or sentence and the suffix -wai on the verbal stem denote the future tense, irrealis mood, *it will not be possible that* (230, 233; 243, 245).

ga'βa(i)- verbal stem, (*to*) *pass through, be amongst* (284, 488).

ga'ri- singular verbal stem, (*to*) *sit* (116, 124, 133, 141, 149, 155, 162, 184, 203, 220, 262, 295, 307, 314, 372). The stem for a dual or plural subject is yï'g^{w}ï-. The usage of 116, in which the singular stem is combined with the plural imperative suffix, is very unusual.

ga'nhi- *house, home, tipi* (7, 13, 43, 95, 505, 509).

gi'ma- verbal stem, (*to*) *come* (21, 77, 364, 420).

ga'sa- *wing, winged* (109, 112, 240, 300).

ga'sagant, ga'kasagant singular and distributive forms, *Winged Creature(s)* (literally, *Wing-Owner*). Poetic for $g^{w}ę'a$, gu'g^{w}ai *bird, birds* (109, 112, 240).

gë- adverbial prefix, *by means of the jaws or biting* (51) cf, gëku'mbax *bites to death.*

kë''a- verbal stem, (*to*) *blow away* (495, 498); dakë''a (*to*) *pulp, ooze* (458, 461, 464) and dakï'si- *smash* (454), are unquestionably related.

(-)gę'a(-) *future or inceptive subjunctive particle, maybe will* or *is about to-* (340). This particle may be either prefixed or suffixed, e.g., në''agęa *maybe I will be* -, gë'aβux *maybe ye two will be* -.

gë'ta- adverbial prefix, *hard, fast, speedily* (382). The suffix -nk^{w} denotes the independent adverb, e.g., pinank^{w} *behind.*

go''i- verbal stem, (*to*) *return, to turn back* (435, 506).

gɔ'tɔ- verbal stem, (*to*) *set afire* (482).

gu- adjectival/adverbial prefix, *by means of fire, as smoke, by means of wood* (472, 477, 494; possibly, 34).

gu''iarïka *Chicken Hawk* (*Falco sp.*) (145).

gu''iget irregular independent adjective, *smoky* (*in the form of smoke*) (494).

ku'šiget irregular independent adjective, *gray* (34).

guke'- verbal stem, (*to*) *gather firewood* (472, 477).

-k *nominal absolute suffix, objective-genitive case* (seę also -t) (5, 7, 43, 84, 87?, 103, 108, 189, 196, 227, 237, 272, 281, 288, 361, 376, 509).

-k *plural* (*and dual?*) *imperative suffix* (77, 92, 116, 350, 472).

-ga- *locative suffix* (393, 505, 512?). This medial suffix is subject to wide modification in meaning through final suffixation, e.g., -gar *toward, among,* -gas *where was,* -garhus *in the direction of, to,* -gaïndës *near, around about, at.* Note also -hat *where had been,* -haïnt *from out of.*

-gant *Owner*; *genitive suffix* (13, 109, 112, 240, 283, 429).

-get *irregular absolute adjectival suffix* (34, 494). This suffix, which has been noted in Shoshone for these two words only, is common in Ute.

-gï-, -hi- *verbal suffix of continuous action* (10, 14, 66, 122, 147, 182, 201, 218, 260, 284, 305, 430, 453, 516). See also -wë'nëxia.

(-gë'wa-), -g^{w}ar locative suffix, *side, beside* (95). The terminal suffix -r, -nt, -(k), is apparently determined by parallelism with the primary demonstrative, verbal noun or participle of the clause, e.g., pë'përanʒugupë mba'βia ganhigë'want ga'nhigant *Weasel has* (*his*) *home beside* (*his*) *Elder Brother's home.* Again, surux sut sï'nagęwar mi'ẏiar (*those*) *two are both walkers beside those quaking aspens.*

g, -k, -h, -x

$g^{w}ęa$ *Bird* (120); distributive, gu'g^{w}ai *birds.*

-k^{w}, -x^{w} verbal suffix, *past tense* (28, 47, 110, 127, 134, 142, 150, 156, 164, 170, 180, 191, 198, 213, 229, 248, 257, 274, 293, 299, 322, 339, 349, 355, 364, 369, 375, 390, 392, 394, 399, 412, 416, 419, 420, 437, 447, 458, 461, 464, 467, 474, 495, 510).

-g^{w}ar- See (-gę'wa).

-h^{w}ak verbal suffix of immediate past action, *after, just after* (492).

-g^{w}an, (-h^{w}an), -x^{w}an verbal suffix of immediate future action, *immediately, right away* (372, 408, 454). Note also the irrealis inceptive suffix -('a)h^{w}ai- *almost, about to, on the verge of.*

h-, -h-, -x

hai''igïna independent adverb, *first* (119).

haβi- singular verbal stem, (*to*) *lie*; more rarely, (*to*) *sleep* (the proper verb *to sleep* is 'ëpu''i). (345, 358). The verbal stem for a dual or plural subject is g^{w}a'βi (*several*) *lie.*

ha'βin *Sleep, Night* (*in the sense of overnight*) (345).

ha'ga- interrogative prefix, *what, who, how, where*? (87, 244, 253, 468).

han affirmative particle, *yes* (61, 401). Derivative from hani- (*to*) *do*.

hani- verbal stem (*to*) *do, make* (245, 349, 384, 386, 469). Note the redundant use of më:- (*to*) *do by hand* and hani- in 469. The compound form naha'(n) has a variety of meanings, (*to*) *act, fetch, travel*, typical of the enormous semantic development of the prefix na- (see below).

-hi'ẉi- verbal stem, (*to*) *fetch, to give to* (379).

hë''ĕči independent adjective (adverb) *slight, slightly, light, lightly* (185, 264).

hĭ'mba interrogative instrumental particle, *by means of what*? (232). Assimilated from the qualitative interrogative prefix hini- *what sort of*?, plus the instrumental suffix, -(m)ba *by means of*. Note also hĭ'mbe- *how much*?, from hi'ni-, plus -(m̀)be *already, enough*.

-x verbal suffix, *present tense, inceptive aspect, (are just starting to)* (46, 104, 267, 302).

-hi- See -gi-.

-hɔ'ik adverbial suffix, *circling, around* (425). Derivative from the verb, hɔ''i- (*to*) *circle*, semantic development: dĕ'hɔ'i (*to*) *hunt*, ta'βuhɔ'i (*to*) *hunt jackrabbits*, pɛ'ŋgʷihɔ'i (*to*) *fish*.

-hu'ⁱ verbal suffix, *conditional* (*would*) more rarely, *optative* (*might*) (333).

m-, -ẉ-, ɱ-

ɱ- *form of the definite article preceding labial consonants* (*b, p, w*> *b*), *the*. Nouns in the abstract drop the final element of the suffix (-t, -k) when defined by the article. (438) See also ɳ-, n̰-.

ma-, mam-, (man-) *single, visible pronominal prefix* (*objective-genitive case*) (95, 284, 407, 415, 420, 423, 430, 431, 436).

marë-, (marēm-), (marën-) *plural, visible pronominal prefix* (*objective-genitive case*) (332, 463, 469).

ma'raŋgʷar independent adverb, *beyond* (95). See also (-gẽ'wa). Compare pi'nankʷ *behind*.

mę independent adverb, *thus* (25, 62, 75, 89, 167, 178, 187, 194, 210, 224, 246, 259, 270, 337, 352, 373, 397, 403, 409, 445, 455, 465, 473).

mę''ac intensive of mę, *thus indeed* (75). See also -ac.

mekʷ interjection, *all right*! (93, 176, 192, 208, 249, 290, 335, 351, 365).

mi'a- verbal stem, (*to*) *go* (92, 96, 102, 259, 350).

më:- *verbal stem*, (*to*) *do* (*by means of the hands*) (469). Note the redundant construction, cf., han-, also *to do*.

mɔ'phɔ *Mosquito* (32, 54, 72).

muš *mouth* (*of a sack*) (383, 389). Note also mu'βⁱ *nose, snout*.

mumbič *Owl* (many species) (153, 160).

-m instrumental suffix, *by means of* (332, 358, 381). See also -a, -bandam.

n, ŋ-, n̰-, n̰-

n-, ʔ- *form of the definite article preceding alveolar and palato-velar consonants* (t, d, k, g, gʷ), *the* (80, 175, 197?, 314, 340, 406, 452, 484, 498). See also ɱ-.

na- *reflexive and correlative prefix, like unto*, (50, 73, 245, 291, 349, 500). Complex semantic developments are possible with this prefix, e.g., na'wu'i <n̰a- + wu''i (*to*) *see*, which may mean (*to*) *resemble*, (*to*) *look around*, (*to*) *look at something indefinite*. See also han-. Finally, note the probable verbal derivative of na-, the stem -nai (*to*) *make*, (*to*) *make out of*, (*to*) *be like*. e.g., ba'-ganaixʷ *made an arrow*, pëmënga'nhinaidëⁱ *what ye will build your house out of*-, wai'-pënait *womanish one, like a woman*.

na'ru'ɛŋgë- verbal stem, (*to*) *tell, relate* (24, 76).

naha'(n)- compound verbal stem, (*to*) *act in any way*, (also, *fetch, travel, approach*) (245, 349). See na-, and hani-. Note nahai' *yonder*.

nana- reduplicated form of na-, *reflexive and correlative of a plural-subject* (41, 442). Typical developments: na'natunas *in a relay*, <tu'na- (*to*) *strive*; na'narạ̀wi *younger-and-older brother* <n̰da'mi *the-younger brother*.

(na'riand), nana'riand singular and distributive forms of the absolute adjective, *dangerous* (41). See also na'na-, di'a-, -(n)d.

na'nand absolute adjective, *all kinds of-, every kind of-* (442). See also na'na-, -(n)d.

na'nĭw *Relative (s)* (42, 50, 73, 85). From na- + nĭw *person, man.*

na'ŋga- verbal stem, (*to*) *hear* (253). Denominative from na'ŋk *ear.*

na'wawu'i verbal stem (*to*) *try* (252, 291). Compound of na- (see above) + wa <*βa by means of?* + wu'i (*to*) *see.*

nayi'kʷ verbal stem (*to*) *live* (500). Note also yĭ'kʷ- (*to*) *do.*

nĕ, nĕ-, nĕ(m)- *first person, singular pronoun, I, me, mine* (22, 24, 42, 45, 50, 69, 73, 76, 78, 115, 186, 223, 294). Note also nĭ'mī *first person, plural, exclusive pronoun*; nux(i) *first, person, dual, probably exclusive, pronoun.*

nīkʷi- verbal stem, (*to*) *say* (*transitive*) (28, 110, 170, 180, 191, 198, 213, 229, 248, 274, 339, 355, 375, 399, 412, 447, 467, 474). See also yīkʷi- (*to*) *say* (*intransitive*).

nĭ'mawa- adverbial/adjectival prefix, *distrustful, distrųstfully* (241).

nĭ'mĕ- plural (and dual?) verbal stem, (*to*) *talk, hold council* (82, 97).

nĭ'ų̨, nĭ'wit, nĕ'wit *singular and plural (abstract) of Man, Person* (3, 100, 443). See also na'nĭw.

nĕ'ų̨i- adverbial/adjectival prefix, *persons, human (obj. or subj.)* (501).

no:- verbal stem (*to*) *pack on the back* (358, 363, 429).

no:'haβid *Ridge;* literally, *that which lies like a pack* (358).

nuki- singular verbal stem, (*to*) *run* (87). The stem used with a dual or plural subject is nura-.

nu:-, -nu: *present subjunctive particle, maybe.* This particle can be prefixed or suffixed to a noun, pronoun or verb. (55, 269). Synonymous with -wiš.

-ŋk- *active causative suffiix*; more rarely, verbal stem, (*to*) *effect, cause to* (478, 479).

-nai adverbial suffix, *away from, out of* (20). Compare -nar *through, between.* Synonymous with -W'ent.

-nt *suffix of the active participle* (114, 122, 147, 260, 305, 330, 501). See also -d.

s, š, -z-

si- *pronominal demonstrative of proximity,* e.g., *he here, him who is here, that which is here* (53, 67, 108, 238, 281, 417, 427). See also i-, -t, -dĕ, -k, su-.

si'βako *Dwarf Owl (unident.)* (289, 298, 320, 367).

sit *pronominal demonstrative indicating proximal, singular subject, this who is; this which is,* (67, 417). See also -t, sur.

si'dĕ *pronomlnal demonstrative indicating proximal plurai subject, these who are-* (53)· Note that use of a separate form for the dual, which should be si'dux by analogy, has not been verified. See also sit, sur, surĕ.

sik *pronominal demonstrative indicating proximal object (singular or plural), to this here, to those here, to that here,* (108, 238, 281, 427). Use of a relative form comparable to suka has not been verified. See also suk, suka.

sĭm *One* (2, 344).

sɔ'yu- verbal stem, (*to*) *annoy* (501).

so:- adjectival/adverbial prefix, *much, very* (57, 477).

so:'weš adverb, *long ago* (57). See also -βe.

su- *pronominal demonstrative of indefinite or, alternatively, extra-visible distance* (1, 5, 11, 15, 26, 29, 31, 48, 58, 64, 71, 90, 98, 101, 103, 105, 117, 125, 128, 135, 143, 151, 157, 168, 171, 188, 189, 195, 196, 199, 204, 211, 214, 225, 227, 235, 247, 255, 268, 271, 272, 275, 278, 286, 288, 296, 303, 308, 316, 318, 323, 324, 327, 338, 342, 353, 356, 361, 374, 376, 377, 387, 398, 404, 410, 414, 426, 432, 439, 446, 449, 460, 466, 470, 475, 480, 483, 490, 497, 502, 507, 512).

šu- adverbial prefix, *by means of the mind* <su'a (287, 312, 315, 402).

(su''a), šu- verbal stem, (*to*) *think, feel* su'βe *then* (324). See su-, -βe.

su'βega independent adjective, *ended*

(512). Note also su'βegant *enough*; see su-, -βe, -ga.

sur *pronominal demonstrative indicating singular subject, he, she, it* (1, 11, 15, 26, 58, 64, 71, 90, 105, 247, 255, 271, 275, 278, 286, 296, 303, 308, 316, 318, 323, 327, 338, 342, 353, 374, 377, 387, 398, 404, 410, 426, 432, 439, 446, 449, 460, 466, 470, 490, 502, 507). See also su-, -t, su'rë, suk.

su'rë *pronominal demonstrative indicating plural subject, they* (29, 48, 98, 356, 414, 475, 480, 497). Note the corresponding dual, su'rux.

su'rënt *relative (absolute) form of the plural, nominative demonstrative, they who are* (31).

suk *pronominal demonstrative (singular and plural), indicating object.* (189, 272, 361, 483). See also sik, su-, -k, uk.

suka *relative form of the objective pronominal demonstrative (singular and plural)*, e.g., *to him who, at that which* (196, 227, 288, 376). See suk, -a.

su'kur *relative locative of previous reference (toward there where mentioned before)* (101). See suk, uk, uk-.

su'waix *relative adverb of previous reference: in the way mentioned before, thus* (204, 285).

šu'ndɔra- compound verbal stem, (*to*) *remember* <šu- *by means of the mind*, and dɔra (*to*) *find* (287).

šu'mbara- compound verbal stem, (*to*) *know, perceive, understand* (312, 315, 326, 402). The stem (m)bara- has not been met independently.

-së''ëc additive suffix of nouns and pronouns, *in turn, also, in addition to* (131, 139, 146, 177, 181, 193, 209, 217). The suffix -suak is synonymous.

ʒ, -ǯ, -c, -č

ʒa, -ʒa adverbial/adjectival or suffix: (1) *well, good, thoroughly, indeed* (330, 386, 396, 431?, 485); (2) *causing to* (430, 489); (3) *be advantageous to* (468).

ʒa'ya compound verbal stem, (*to*) *seize well* (485). Compare ya: (*to*) *seize*, wi'ya (*to*) *drag, pull*, da'ya (*to*) *snatch*, ge'ya (*to*) *catch*.

ʒatɔ'ya- probably compound verbal stem (*to*) *open* (431). Note na'ʒatɔya *door*.

ʒapai'- compound verbal stem, (*to*) *take off* (430). Compare wai- (*to*) *come down, climb down*.

ʒa'wi- probably compound verbal stem, (*to*) *throw* (489). Compare wupi'- (*to*) *jump*.

ʒi'togia *Indian hemp, Apocynum hyperfolium* (378).

cu''a- verbal stem, (*to*) *consume, destroy* (51, 74).

-ǯ, -ʒ *stative participial suffix, being in a condition of-* (52, 182, 201, 218, 325, 430, 453).

-ci *diminutive suffix, little, dear* (4, 239, 273, 282, 300).

w, W

we:' ha- verbal stem, (*to*) *flame* (487); probably a crystallized compound cf., waya'- (*to*) *flame up, burn*; W'e'W'i- (*to*) *streak by*.

waši'-, wasï'- verbal stem, (*to*) *kill*, (*to*) *be killed* (52, 444).

wi' *Now* (30, 49, 59, 106, 118, 126, 129, 136, 172, 200, 215, 236, 256, 266, 279, 297, 304, 309, 319, 328, 343, 357, 380, 388, 433, 450, 476, 481, 491, 496, 503, 508).

wï- adverbial prefix, *by means of blows* (423, 425, 437, 440).

wïtï'k^{w}a- verbal stem, (*to*) *strike* (423, 425, 437). Note also the reduplicated form, wïtï'k^{w}awïtïk^{w}a- (*to*) *tumble*.

wïco'x^{w}a- verbal stem, (*to*) *pound* (440).

wu- adverbial prefix, *by means of a rope* (384, 390).

wu- adverbial prefix, *by means of sight, in view* (315, 341).

wu''i- verbal stem, (*to*) *see* (252, 291, 325, 347, 360). Note also ɱbu''i *the eye*.

wupi'- verbal stem, (*to*) *leap, jump* (322, 453, 457) See also ʒa'wi-.

(-wai-), -waix adverbial suffix, *in the manner of, like* (204, 205, 285). See also su'waix; compare na- (-nai).

-wai See ke -wai.

-wag dative suffix, *to, with* (22, 69, 83). The nominal suffix -ma is synonymous.

-wa'gant stative form of -wag, *being with* (78, 407, 415). <-wag plus *stative suffix* -xant. See also -gant; compare -š.

-wand partitive suffix, *one of, a part of* (459, 463). Compare -ĩn.

-W'ent adverbial suffix, *away from* (113, 117). Synonymous with -nai.

-wiš, (wiš-) *present subjunctive participle, may be.* This particle can be prefixed or suffixed to a noun or pronoun. (268). Synonymous with nu:-

-wẽ'nẽxia *verbal suffix of repeated action,* (440, 457). See also -gĩ-.

y

yĩ'g^{w}ĩ- verbal stem, (*to*) *say* (*intransitive*) (63, 259, 455).

yĩ'zĩ singular verbal ṣtem, (*to*) *fly, rise* (114, 122, 147, 182, 201, 218, 257, 260, 293, 299, 305, 369, 392). The verb for a dual or plural subject is yuri-.

PHONEMES AND MORPHOPHONEMES OF TEMOAYAN OTOMI

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0. Introduction
1. Description of phonemes
2. Distribution of phonemes in the syllable
3. Morphophonemes

0. The dialect of Otomi described here is that of San Pedro Arriba, a town of perhaps two thousand, in the municipal district of Temoaya, State of Mexico, Mexico. Data were collected from various sources, of which the three chief ones were Romula Montes de Oca, a woman of fifty or so; Andrea, a woman of thirty or a little less; and Mateo Damian, a man probably in his middle thirties. Characteristic of the people of this town, the two women understand some Spanish but speak little or none; the man understands Spanish and speaks some, but is without a fluent command of the language. Data were gathered over a non-consecutive period of about ten months.

1. Description of phonemes: 23 consonants, 12 vowels, 3 tonemes, 2 juncture phonemes.

1.1. Consonants. The consonant phonemes are: p, t, k, k^{w}, s, š, b, d, g, g^{w}, z, ž, c, č, h, ʔ, l, r, m, n, ñ, w, y. These consonants may be classified by their phonetic features, to be described immediately; and by their distributional features, to be described in **2.**

Otomi consonants which are contrastive as to voicing are voiceless: p, t, k, k^{w}, s, š and voiced: b, d, g, g^{w}, z, ž; those which are non-contrastive as to voicing are c, č, h, ʔ, m, n, ñ, w, l, r, y.

1.1.1. Consonants with contrastive voicing are stops and fricatives. The stops are bilabial, alveolar, velar, and labiovelar. The fricatives are alveolar and alveopalatal.

Illustrations of voiceless series: pónt?i[1] *cross*, tǒ *wife's mother*, kǒ *husband's mother*, k^{w}é *spirit, temper*,[2] nsó?thó *therefore*, nšäški *brush*.

s is a comparatively rare phoneme and does not occur in word-initial position.

Illustrations of voiced series: bì *robber*, dómi *money*, gú *ear*, ng^{w}àni *hill*, zàną *month*, žéšthi *sandal*.

Word-initially or when preceded by a vowel the voiced stops are fricativized non-phonemically, especially by speakers of Otomi who also speak Spanish: mà-gú[3] *my ear*. When preceded by ?, d is retroflexed and phonetically resembles a retroflexed flap [ɽ] : ?dók?a *potato*.

ž is a comparatively rare phoneme. After n, the phoneme ž appears as an affricate in the word činži *violin, guitar*.

1.1.2. Consonants without contrastive voicing.

The affricates are alveolar and alveopalatal. The glottals are h and ?. Illustrations: cä *husband's father*, čǔšti *he toasts (something)*, hé?mi *paper*, ?ą̀i[4] *spearmint*.

[1] Tone is marked over the vowels of roots and prefixes; see **1.3.** I am indebted to Eunice V. Pike of the Summer Institute of Linguistics for the interpretation of the tonal phenomena on suffix syllables as non-phonemic. Her recent study of the tone in Mazahua, a language closely related to Otomi, suggested this helpful interpretation of my data.

[2] There is no exact equivalent in English for this word, which is used in the Otomi expressions for fatigue and for anger. When assigned a location the k^{w}é is said to be inside the stomach.

[3] When the root is preceded in the word by one or more syllables, a hyphen is written before the first syllable of the root; see **1.4.**

[4] Post-vocalic i consistently carries a high tone. I have considered this post-vocalic vowel to be a suffix and consequently omitted the tone as non-phonemic. See **1.3.2.** and **3.5.1.**

h is a glottal spirant which may have additional palatal or velar friction, depending upon the position of the phoneme that follows.

Liquids, nasals, and semivowels. The liquids are an alveolar lateral and an alveolar flap. The nasals are bilabial, alveolar, and alveopalatal. The semivowels are bilabial and palatal. Illustrations: lĕngu *little*, rét$^{?}$a *ten*, mèphi *worker*, nǎni *lime*, ñą́ *head*, wá *foot*, yǒ *candle*.

l is a rare phoneme except in words borrowed from Spanish.

When a nasal consonant precedes a stop, affricate, or fricative in word-initial position, it is phonetically syllabic and carries a low tone. In syllable-final and word-medial position the nasal has the same tone as the preceding vowel and is non-syllabic. In syllable-initial position when followed by a vowel, the nasal has neither tone nor syllabicity. The tone or syllabic character of nasals is subphonemic.

Before any velar stop n becomes the nonphonemic velar nasal [ŋ] : mà-ngǔ *my house*.

1.2. The vowel phonemes are voiced. They may be classified as vowels which are contrastive as to nasalization: unnasalized: i, a, u and nasalized: į, ą, ų; and vowels which are non-contrastive as to nasalization: e, ɛ, ɔ, o, ə, ʌ.

1.2.1. Vowels with contrastive nasalization.

i, į are high, front, close, unrounded; as in khí *blood*, $^{?}$[k^{w}]a *come here*!

a, ą are low, central, open, unrounded; as in bàda *pitcher*, thą́ *corn*. In unstressed, open syllables, a may be both raised and fronted non-phonemically to [æ] : rá-cí *he is eating*.[5]

[5] The occurrence of [æ] in the circumstances described here has been treated as non-phonemic. However, from investigation to date, I cannot be sure that this is not a morphophonemic substitution of ɛ for a.

u, ų are high, back, close, rounded; as in nùgó *I*, $^{?}$ų́ *salt*. Nasalized ų occurs much more frequently than unnasalized u.

In general, nasalized į, ą, ų contrast with unnasalized i, a, u; as in rá-hì . . . *she is washing her hair* [. . . indicates non-final]: rándà-hį . . . *it is very deep;* dà-màhki *it will stretch it* : màhki *she loves me*; dí-$^{?}$úni . . . *I give him* (*something*) : dí-$^{?}$ų́$^{?}$mi . . . *I heat* (*a pot*). However, after a cluster of h plus a nasal consonant, which combination actualizes as a voiceless nasal phonetically, these nasalized vowels occasionally alternate with their unnasalized counterparts: [hmí] ~ [hmį] *tortilla*; cf. [šó-hñámbì . . .] *he took off* (*someone else's hat*), [hín gì-hñą́mbíbí . . .] *don't take* (*something*) *away from her*. After a cluster of h plus a nasal consonant, nasalization of i, a, u is an optional morphophonemic feature. Where alternation between the nasalized and unnasalized vowels occurs, I have arbitrarily written the unnasalized vowels in my phonemic data, thus: hmí *tortilla*, šó-hñámbi . . . *he took off* (*someone else's hat*), hín gì-hñámbibi . . . *don't take away* (*something*) *from her*. But when the vowel is consistently nasalized in our phonetic data (and after a cluster of h plus a nasal consonant the incidence of į, ą, ų, consistently nasalized, is high) it has been written phonemically as nasalized.

1.2.2. Vowels without contrastive nasalization.

e is mid, front, close, unrounded; as in déhe *water*. e has a nasalized allophone [ę] which occurs before nasalized į in the interjection hèį *ouch! it's cold!* In an open syllable e may be actualized as the vowel glide [e^{i}]: rà-pèni *she is washing clothes*.

ɛ is front, unrounded, varying non-phonemically from mid, open to low, close; as in dèsɛ *wild cherry*.

ə, ʌ are unrounded, central; as in t$^{?}$ə̀ *son*, t$^{?}$ʌ́ *mountain*. ə tends to be high, back-central, close; ʌ tends to be mid, front-central, open.

o, ɔ are back, close, rounded; mid and low

respectively; as in t?ŏni *louse*, ?ǒ *flea*. When it occurs in a syllable closed by n, o may be non-phonemically raised to [ʊ]: ?móndɔ *Mexico City*.

1.3. Tonemes. Tone is phonemic both upon root syllables and upon prefix syllables but is limited in distribution upon the latter.[6]

1.3.1. Tone on root syllables. There are three phonemic norms of tone on root syllables. These are high /ˊ/, low /ˋ/, and rising /ˇ/. The three following pairs of words show that high and low tones, high and rising tones, and low and rising tones are phonemically distinct: dí-hóhki . . . *I clean* (*something*): dí-hòhki . . . *I sharpen* (*a knife*); rá-?yó . . . *he is walking it* (*a horse*) : rá-?yǒ . . . *he is walking*; dí-hèc?e *I sneeze* : dí-hěc?e *I cover* (*someone*) *with a blanket*.

The high tone has a free allotone of a phonetic mid tone: déhe [déhé]∼[dēhé] *water*. Another phonetic variation of the high tone is a non-phonemic high-mid glide, which, however, does not appear before the glottal morphophoneme H.[7] The occurrence of this glide is dependent upon stress.[8] It is heard frequently in the speech of individuals who utter the stressed or root syllable with a pronounced, but non-phonemic, lengthening of the vowel, and it may disappear when the speed of an utterance is increased: šą́t?ą [šą́t?ą́]∼[šą́ą̄t?ą́] *nopal*.

The rising toneme is uniformly a glide rising from mid to high.[9] Since this glide is both rapid and slight, it is easily confused by the unaccustomed ear with the level mid or with the level high allotone of the high toneme.

The low toneme is uniformly a level low tone.

The tones on some root syllables change morphophonemically under certain circumstances. Without describing these perturbations in detail, we illustrate a few types of tone changes, giving for each construction cited one example of a root on which the tone changes and one example of a root on which the tone remains constant. Following an adjective (any of several adjectives with different tones might be used) such as k?ǎšti *yellow*, dą́htų *clothing* > dą̀tų: k?ǎšti dą̀tų *yellow clothing;* dɅni *flower* remains the same: k?ǎšti dɅni *yellow flower*. In utterance-final position, thèni *laugh* (*at*) > théni: dí-šǐphi mà-bą̀hci gì-théni *I tell my child, 'Laugh!'*; but šǒdi *study* remains the same: dí-šǐphi mà-bą̀hci gì-šǒdi *I tell my child, 'Study!'* After the prefix ?ì- *he, she, it,* pǎni *go out* >pɅni: ?ì-pɅni màt?ǒ *my son goes out;* but ?i̧na *say* remains the same: ?ì-?i̧na mà-t?ǒ *my son says*.

A more consistent feature in the tone phenomena is the absence of low tone on a root syllable in isolation or in utterance-final position. Hence t?ǒ *son* (utterance-medially) >t?ó in isolation or utterance-finally; ngù *house* (utterance-medially) >ngṻ in isolation or utterance-finally.

I have not made a detailed analysis of tone on the second syllable of a compound root, e.g. ?ñúthé *irrigation ditch*, ?míndɅni *cosmos seed*, but I have considered this tone phonemic.

[6] Since writing this paper, I have had opportunity to make a brief investigation of the Otomi dialect of San Andres Timilpan, a town north of Temoaya in the State of Mexico. Study in this dialect would suggest that tone is not limited in its distribution upon prefix syllables.

[7] See **3.5.**

[8] Actually, I have no evidence to show that the glide of the rising toneme does not also depend upon stress. (The hypothetical elimination of the upglide as phonemic would leave us with a register system of three levels, of which the two upper levels are modified by the addition of a glide in stressed syllables.)

[9] Sinclair and Pike, in their article The Tonemes of Mesquital Otomi, IJAL 14.91-8 (1948), say that "The rising toneme/ˇ/ begins in the low register and rises to the high register." While this is not true phonetically of the rising toneme in the Temoaya dialect, it may be the best phonemic interpretation of my phonetic data, assuming that in the upglide, low pitch is raised to nonphonemic mid before high pitch.

1.3.2. Tone on non-root syllables. The high and low tonemes occur upon non-root syllables, as shown in the pair of utterances rá-ʔyǒ *he is walking* (*over there*): rà-ʔyǒ *he is walking* (*nearby*). The rising toneme occurs very rarely on non-root syllables.[10] I have found it on the two morphemes -hě *we* (pl. excl.), -ʔbě *we* (du. excl.) which appear to be suffixes.[11]

As on the root syllable, the high toneme has an allotone of a phonetic mid tone: ší-ntí [šĭn'tí] *he's drunk*. However, the falling-glide allotone is absent on non-root syllables, for it appears only on stressed syllables.

The tonemes on prefixes do not appear to undergo tone changes.

With the exception of the two morphemes -hě and ʔbě (cited above) suffix syllables carry either a high or a low tone. These tones are not phonemic. Whether a suffix syllable carries a high tone or a low tone depends largely upon whether the speaker is a monolingual or a bilingual and whether or not the suffixial syllable is followed by pause.

In the speech of monolinguals the tone on the final, suffixial syllable of an isolated word or a short phrase is generally high. Bilinguals may allow the voice to drop on the final, suffixial syllable of an isolated word or a short phrase if the tone on the preceding root syllable is high or rising. In their speech the drop of the voice after a root syllable with rising or high tone simulates the voice drop on the unstressed final syllable of a Spanish word. Illustrations: monolingual speech [ʔi̯ná], bilingual speech [ʔi̯nà] *tell him*!; monolingual speech [yǎ tó-hóhkí], bilingual speech [yǎ tó-hóhkì] *I already cleaned it*.

Within a continuum verbs may carry either a high or a low tone on the final, suffixial syllable, depending upon the speed of the utterance and the presence or absence of pause. The tones on verb suffixes in utterance-medial and word-final position tend to be low in fast speech and high in slow speech or before a pause. Note the tone change in the suffix -tʔi in the following utterance: fast speech [tómá-ʔi̯tʔì déhé màphání], slow speech [tómá-ʔi̯tʔí déhé mà-phání] *I went to water my horse*.[12] As illustrated by the word [déhé] *water* in the utterance just cited, the tones on noun suffixes in utterance-medial and word-final position are not necessarily low in fast speech. Possibly the tone on the noun root has some influence on the tone on the suffix. Cf. [déhé . . .] *water* and [ndòʔyò . . .] *bone*, both occurring in fast speech. (See illustrations under **1.4.1** for the latter example.)

1.4. Juncture. There are two phonemes of juncture: root-initial juncture and word juncture.

1.4.1. Root-initial juncture /-/ is identifiable phonetically but is correlated with a morphological phenomenon. /-/ marks the initial syllable of a root morpheme when it is preceded in the word by one syllable or more. Phonetically, /-/ is actualized as stress on the syllable which follows.

Stress and tone are not conditioned by one another,[13] except for the probable limitation

[10] Several prefixes in the San Andres dialect carry the rising toneme. In the absence of stress, I could hear no glide and recorded a "mid" tone. Possibly a misinterpretation of phonetic "mid" tones on prefixes in the Temoaya dialect accounts for the lack of the rising toneme on prefix syllables in my data.

[11] But further investigation might show them to be enclitics.

[12] Note that the slow speech form also has a change of tone on the vowel of the root syllable preceding the suffix.

[13] While I was still among the Otomi of the Temoaya region, a different interpretation of the prosodic features of Otomi was suggested to me in conversation by Robert Weitlaner of the National School of Anthropology, Mexico City. Weitlaner's suggestion was that stress and high tone coincide and that tone glides are accounted for by the presence of geminate and non-geminate vowel clusters of which one member is stressed and the other unstressed. According to this suggestion pitch is merely incidental to stress, and vowel length is phonemic. I considered the hypothesis but came to the following conclusions with regard to the Temoaya dialect: that my phonetic data is

of the rising glide to stressed (i.e. root) syllables (see **1.3.2.**). Unstressed syllables occur both with the high and with the low toneme Stressed syllables may occur with each of the three tonemes. We illustrate, giving both phonetic and phonemic renderings: rá-zǒ [rá'zǒ] *it is well, good*; dí-cʌ́ʔt ʔibi ró-né [dí'cʌ́ʔ-tʔíbí ró'né] *I kiss her mouth*; dà-dụ̀ ...[dà'dụ̀...] *he'll die* (non-final in utterance); ʔì-cà ʔnà ndòʔyo kʔà ʔyó [ʔì'cà ʔ*nà n'*dòʔyò kʔà 'ʔyó] *the dog chews a bone;* mà-ngụ̌ [màn'gǔ] *my house;* gòmá-hą̀ši ʔnà dǒni [gòmá'hą̀šì ʔnà 'dǒní] *I'm going to fry an egg.*

A light, secondary stress is sometimes heard on the second syllable before and the second syllable after the first root syllable, as in zàphàni ['zàphà"ní] *straw*. This stress is not strong enough to be confused with the stress which signals a root-initial juncture. The stress which is characteristic of root-initial juncture is strong and occurs nowhere else.

In addition to being stressed, the first syllable of the root is pronounced more deliberately than the other syllables of the word, at least in slow speech. This results either in the phonetic (but non-phonemic) lengthening of the vowel in that syllable, or in the rapid slurring-over of the non-root syllables. There is no evidence to indicate that vowel length is phonemic. It does not occur except in stressed (i.e. root) syllables. The presence of a rising or falling tone on the root often gives an auditory emphasis to this apparent length, but the vowel of a root syllable with a low tone may also be lengthened.

1.4.2. Word juncture is marked by a space. When there is no root-initial juncture /-/ present, the word-initial juncture and the root-initial juncture coincide, being identified by the presence of root-initial stress, as described above.

The occurrence of either one of the two following non-morphological features identifies a word juncture. (1) Pause is sometimes heard between words but tends to disappear in rapid speech. (2) Any one of the clusters šp, št, šk, šr occurring syllable-initially marks a word juncture when root-initial juncture /-/ follows in the same word. These clusters occur word-initially in pre-root position chiefly in rapid speech.

The two features just described occur only occasionally. Therefore, when there is a root-initial juncture /-/ present, the only reliable means of identifying the word juncture are morphological.

2. Distribution of phonemes in the syllable.

The phonemic structure of the root shows best the distribution of phonemes in the syllable. This is because the affixes are relatively few in number and contain a limited variety of phonemic combinations. And certain features of phonemic structure occur rarely or are absent from the structure of the affixes but are important in the structure of the language as a whole. These features are the rising toneme, nasalized vowels[14] (except those resulting from vocalic harmony), vowel clusters, syllable-final consonants. Therefore, root syllables are used for this description.

2.1. Open syllables. The following seven patterns of open syllables commonly occur: (1) CV, (2) CVi, (3) CCV, (4) CCVi, (5) NCV, (6) NCVi, (7) NCCV. We lack an

incompatible with any interpretation which correlates stress with high tone, or vowel length with any particular tone or combination of tones. Leon and Swadesh's article, Two Views of Otomi Prosody, IJAL 15.100-5 (1949) suggests a similar hypothesis. I have no objection to the word division advocated in their article, but the application of this word division to my data would make neither stress nor tone predictable.

[14] In the San Andres dialect we find nasalized vowels, as well as the rising toneme, in prefix syllables. In rapid speech, nasalized ą in an unstressed syllable tends to have a neutral quality and is easily mistaken for an allophone of the vowel A. For this reason, I suspect that nasalized vowels do occur in prefixes of the Temoaya dialect, though I recorded none.

example of the theoretically possible syllable pattern *NCCVi. In these formulae, C stands for a single consonant, V for a vowel, and N for n or m. The sequences of consonant + vowel are very free and appear to be unlimited. In contrast, the sequences of consonant + consonant and of vowel + vowel are limited and special in nature.

2.1.1. Consonant sequences.

The consonants of this dialect may be classified distributionally as those which unite and those which do not unite with h or with ʔ to form a sequence. Those which unite with h or with ʔ to form a sequence are p, t, c, č, k, kʷ,[15] b, d, m, n, ñ, r(ʔ), w, y. Those which do not unite with h or with ʔ to form a sequence are g, gʷ, s, š, z, ž, l, h, ʔ. The specific sequences thus formed are given in the descriptions of syllable patterns 3, 4, and 7 (as listed above).

Further checking would be necessary to be sure that the ʔr sequences given in my data are not phonetically [ʔɽ], which is phonemically ʔd. Unlike the nasals and semivowels, r does not combine with h to form a sequence. Its union with ʔ is therefore somewhat dubious.

In patterns 1 and 2, C stands for any consonant except gʷ and s. Illustrations of root-initial consonants are given in the description of the consonant phonemes, **1.1.**

In patterns 3 and 4, two types of consonant sequences are permitted, in which one of the glottal phonemes either precedes or follows one other consonant phoneme. The symbols C_1 and C_2 in the formulae below stand for the first and second consonants of a sequence, respectively.

Type A. If C_1 = p, t, c, č, k, or kʷ, C_2 = ʔ or h, except that the clusters *pʔ and *čh do not occur: tʔǒni *louse*, cʔí *tooth*, bì-čʔą́hki . . . *he flapped* (*his ears*), kʔàni *greens*, rà-kʷʔáštigi *you are splashing me*, phànthʌ́ *deer*, thégi *saw*, chài *pond*, khí *blood*, kʷhá *rabbit*.

Type B. If C_1 = ʔ or h, C_2 = m, n, ñ, w, or y; in addition, if C_1 = ʔ, C_2 = b, d, or r: rá-ʔméc?ó *they are vulgar*, ʔníhi *also*, ʔñǒwi *companion*, ʔwěné *infant*, ʔyó *dog*, ʔbèhto *grandchild*, ʔdíhi *quickly*, dà-ʔràhki . . . *he's going to give me . . .*, hmí *tortilla*, hnàzǎ *variety of tree*, hñéthé *rainy season*, hwá *wing* hyádi *sun*.

In patterns 5 and 6, N = n or m, and C = p, b, t, d, k, g, gʷ, c, č, s, or š. When C = p or b, N = the homorganic m; otherwise N = n: mpìšti *inflated skin, balloon*, khà gí-mbóniwi *do you two take turns?*, dó-ntèi *I've grown up*, ndą́hį *wind*, nkhǒthą́ *corn smut*, ngǒ *fifty centavos*, ngʷá *wheat stalk*, ncáhki *life*, nčíʔmó *snail*, ʔì-nsóni *it flies*, ʔì-nšě *he is ruffled* (*a turkey gobbler*).

Pattern 7 combines the compatible features of pattern 5 and of patterns 3 and 4A Thus, N = m before p and = n before t, k kʷ, c, č. With C_1 limited to the consonants just named, C_2 = ʔ or h, except that the clusters *mpʔ and *nkʷʔ have not been found: ntʔéndó *slingshot*, nkʔòsi *oak ball*, rò-ncʔéhthó *he is bad*, mà-nčʔóʔyé *my left* (*ugly*) *hand*, mphą́hthą́ *corn with oversized kernels*, nthą̀cʔa *pine cone*, nkhóʔmi *shoe*, gìmá-nkʷhą́ni *go and confess*, nchàntʔi *parting in the hair* nčhį̀ña *shin*.

As well as the four common types of consonant sequences described, the following uncommon sequences occur: sp, sn, št, ʔñw; as in dèspi *live coal*, ʔnà snǫ́ *one month*, štą̌ *hair*, gírí-ʔñwéh nàrì-nčʔóʔyé *you are sewing with your left hand*. Three of these clusters appear to result from contractions, as follows: spí, snǫ́, and štą̌<cìbi *fire*, zą̀nǫ *month*, and *šĭñǫ́ *hair* (*head tegument*), with št appearing in place of the non-permitted cluster *šñ. In the cluster ʔñw, the ñ is an infix and the root-initial cluster is ʔw.

In addition we find the sequence tʔw in the second syllable of the compound root hwítʔwá *trousers*, derived from hwìcʔi *cover* +wá *legs*. In place of the non-permitted se-

[15] Phonetically, a cluster of a voiceless stop or affricate plus ʔ or h results in a glottalized or an aspirated stop or affricate, respectively.

quence c?w the sequence t?w appears. This is its only occurrence in my data.

Other sequences which occur in the language but which I have not found in root syllables are dr, as in ?móndri *horns* (derivation unknown), and the sequences šp, šk, šr. The latter three sequences develop when the vowel of the prefix ší- perfect indefinite is lost in rapid speech, as in the following utterances: špá-gòhi *she has already come back*, škó-phíya thŏ *you've only bought it on credit*, šró-?yòt?i (*corn*) *that's dried*. It will be noted that most of these less common sequences, whether found in root syllables or non-root syllables, cross morpheme boundaries.

2.1.2. Vowel sequences.

Syllable nuclei are V or Vi. Examples of single vowels as syllable nuclei are as follows: šídó *eyelashes, eyebrows*, hñɲt?i *spin*!, péhthó *count* (*them*)!, ?bɛ́hthó *not yet*, tŏmə *butterfly*, dí-?ʌde *I hear*, hín gà-mà *it isn't long*, dą́htų *clothes*, chùni *boiled corn*, thų́hni *chair, bench*, kót?i *close* (*the door*), dí-?bò?t?i *I wind* (*something*).

Vowel sequences may be composed of e, ʌ, ə, a, o, or ɔ plus i, or of ą or ų plus į. These sequences invariably carry the low toneme on the first vowel and the high toneme on the second, which sequence actualizes phonetically as an upglide. (See fn. 4.) In the case of vowels which contrast as to nasalization, vowel sequences are homogeneous with regard to nasalization. Examples of Vi sequences as syllable nuclei illustrating syllable patterns 2, 4, and 6: ?ì-hèi . . . *he wears* . . ., dà-?bʌ̀ik?i *it will get you wet*, mə̀i *stomach*, thài *reflection*, ?òi *bed*, mòi *fish*, dà-zą̀į *he'll become accustomed*, nšų̀į *night*.

An alternate interpretation of post vocalic i is to consider it as syllable-final y with a nasalized allophone which occurs after a nasalized vowel.

2.2. Closed syllables. Patterns 1, 3, 5, and 7 for open syllables may occur word-medially closed by a single consonant, thus: CVC, CCVC, NCVC, NCCVC. In these formulae, the prevocalic consonants or consonant clusters are the same as in the open syllable patterns. No vowel clusters occur in closed syllables; otherwise there is no restriction as to the vowels which may occur. The final consonant is one of the following: m, n, s, š, ?, h. We do not have examples of each of these consonants syllable-finally in each of the four patterns for closed syllables, and consequently give only a partial series of illustrations: CVC, ?ì-dánc?i *he groans*, mŏšmí *napkin*, gòmá-tà?mi . . . *I'm going to shell* (*corn*); CCVC, ?yémbi *throw it to him*, dà-théska ?dí *they'll drive you out in a hurry*, rà-?bə̀hthó *she's here*; NCVC, ndɲnthi *tumpline*, nšăški *brush*, nsó?thó *consequently*; NCCVC, nčhʌ̆nge *cotton skirt*, nthą́?c?i ?bě *weaving stick*, nc?òhki *sin*.

There is a single example of a syllable-final r in dŏrga *green peas*.

As a rule, closed syllables occur word-medially. However, as a result of apocope of the final syllable, an occasional closed syllable is found in word-final position. The following examples have been found, showing g, t?, š, and n in syllable-final and word-final positions: bó-?ing ?à-thí<bó-?ingi ?à-thí *go and play outside*; bì-ñŏt? ?à-mbŏ<bì-ñŏt?i ?à-mbŏ *he went inside*; bì-hñų́š nʌ̀-gų̀į<bì-hñų́c?i nʌ̀-gų̀į *clouds were overhead*; phón thòi<phónt?i hòi *dust is blowing around*. In the last example fusion has taken place across the word boundaries.

3. Morphophonemes. The description of the morphophonemics given here is by no means exhaustive. However, several conspicuous segmental phenomena are listed and exemplified.

3.1. Phoneme alternation. Occasionally, free alternation occurs between full phonemes. The cluster ch alternates in some morphemes with s, in others with š, as illustrated: móchɲ~mósɲ *sheepskin pulque bag*, dí-chí?mi~dí-ší?mi *I dig*. The cluster c?

sometimes alternates with š in the morpheme -c?i, as in dí-hụ̀c?i∼dí-hụ̀ši *I put on* (*a hat*). h alternates freely with ? in the morpheme ?á∼há *where*?: ?á gì-má yà∼há gì-má yà *where are you going*? In the morpheme ?bʌ̀ *if, when*, b may alternate with m: ?bʌ̀ ští-nkhʌ̌pʌ́∼?mʌ̀ ští-nkhʌ̌pʌ́ *if I should do that*....

3.2. Apocope and syncope. In rapid speech apocope of the vowel of the first-order suffix is common in verb forms, as in bì-zʌ́h yə̀-déhti<bì-zʌ́hʌ yə̀-déhti *the sheep have arrived*. If the consonant cluster of this suffix is c?, this is replaced by š when the vowel is lost. We illustrate: yʌ̌ ší-bʌ́š nì-hyádi<yʌ́ ší-bʌ́c?e nì-hyádi *the sun has already risen*.

Vowel loss may also occur word-medially in a compound. Such a loss may occur when the first member of a compound is dissyllabic, in which case the suffixial vowel of the first member is lost, as in ?míndʌ̀ni *cosmos seed*<?míni *thorn, briar* + dʌ̀ni *flower* and in phʌ̀nthʌ́ *deer*<pháni *horse* + t?ʌ́ *mountain*. Such a loss may also occur when the first member of a compound is monosyllabic and the second is dissyllabic, in which case the root vowel of the second member is lost. Thus, déhe *water*>thé in ?ñụ́thé *irrigation ditch* (*water road*); mbʌ́hʌ *foreign man*>phʌ́ in ñámphʌ́ *Spanish* (*foreign talk*): šótha *back*>štha in ndúštha *to carry on the back*. In each of these cases, the vowel loss occurs in the syllable which immediately follows the first root syllable in the elements of the compound, i.e. in the first unstressed syllable in the unreduced compound.

3.3. Assimilation of consonants. Before bilabial stops n>m throughout the language, as in hín gì-hñámbibi *don't take it away from her*, cf. hín gì-hñángigi *don't take it away from me*.

Unvoicing of the stops d and b before h occurs in the compounds ?ñụ́thé *irrigation ditch*, ñámphʌ́ *Spanish*, of which the derivation is given above.

In the compound phʌ̀nthʌ́ *deer*<pháni+t?ʌ́, ? in a stop+? sequence is assimilated to h in the previous stop+h sequence. (This actualizes phonetically in a change from glottalization to aspiration.)

3.4. Assimilation of vowels. There is a rather extensive pattern of vowel assimilation, in which the vowel of the first-order suffix is assimilated completely or partially to the vowel of the root.

Examples of stems containing identical vowels in the root and first-order suffix syllables are numerous: thìdi *tamale*, hín gì-?íhkhį *it doesn't cut*, thèhe *a cold*, dèsɛ *wild cherry*, tə̌mə *butterfly*, dá-cʌ̌hʌ *I'll arrive* mánčha *ear of fresh corn*, šą́t?ą *nopal*, gúru *wheel*, tụ̌hų *he sings*, thóšo *serape*, ngóro *turkey gobbler*.

Possibly suffixes of the first order which are composed of h followed by a vowel identical with the root vowel are not separate morphemes but are simply a rearticulation of the root vowel. The following forms would suggest such an interpretation: gòho *four* gǒ zą̀ną *four months*, ri-nc?ohki sɛhɛ∼ri-nc?ohki sɛ (tone marks absent in my data) *your own fault*, mànga ?díhi∼mànga ?dí *say it quickly*!

Some first-order suffix vowels are assimilated to the level of the root vowel. The vowel of the suffixes -c?i, -t?i, -ti, -di, -ki, -gi regularly becomes e after the root vowels e, ʌ, as in ?bʌ̀c?e *ribs, basket*, ?ʌt?e *to make*, nkhʌ́de *woolen skirt*, kʌ́hte *to clothe from the waist down*, tʌ́ge *to ride*, phʌ́hke *to crack open* (trans.), hĕc?e *to sneeze*, thède *to laugh*, thĕge *to use up*.

Assimilation of the vowel of the second syllable to the level of the vowel of the first syllable may also occur in compounds, as in šíngú *body hair*<ši *tegument*+ngʌ́ *flesh*.

The vowel of the noun suffix -hi (meaning unknown) agrees with the root vowel with regard to nasalization, as in ndą́hį *wind*, móhi *dish*.

3.5. The glottal morphophoneme H. Conspicuous in this dialect of Otomi is the sylla-

ble-final appearance of ʔ or of h, depending upon the phoneme that follows. We refer to this as the glottal morphophoneme, or H, since it is the appearance of one or the other of the glottal phonemes and often has a morphological function. When H appears in root syllables, which are stressed, the nonphonemic vowel lengthening often associated with stress does not appear. Thus, a root vowel followed by H sounds "short" when compared with the same root vowel when not followed by H; cf. pàtʔi [pààtʔí] *to grow warm, hot*: pàʔtʔi [pàʔtʔí] *to make warm, hot.* In the speech melody of this dialect, H is analogous to the rest in a musical phrase, interrupting its continuity.

The glottal morphophoneme may close a root syllable if that syllable is a bound morpheme and if it is the first syllable of a polysyllabic root. Its occurrence in any other circumstances is questionable.

In a compound root, only the first root syllable is stressed, and the glottal morphophoneme does not appear in the succeeding syllable: šɔ̀mbàçi *pupil*<šɔ̀di *study*+bàhci *child.* In the compound, bàhci loses both its stress and its syllable-final h.

3.5.1. Phonemic description of H. Whether ʔ or h occurs as the glottal morphophoneme depends upon the first phoneme or cluster of the syllable that follows. Before pʔ, tʔ, kʔ, cʔ, m, and r, H = ʔ. Before p, t, k, c, č, th, kh, s, n, y, and word-initial š, H = h.

In the two words nčhįʔnčhį *upper arm*, žáʔnši *banana*, ʔ may be the glottal morphophoneme before the clusters nčh and nš respectively.

Examples of ʔ as H are: rá-ʔbɔ̀ʔpʔə . . . *he is standing (at the door)*; tʔɔ̀ʔtʔi *spring of water*; rá-hóʔkʔi *he's lying to you*; tʔóʔcʔi *wound ball (as of yarn)*; gòmá-tàʔmi . . . *I'm going to shell (corn)*; hín gì-cŏʔ rì-ngǔ *don't leave your house.*

Examples of h as H are: kó-pìhpi *you stole (something) from her*; šìhto *glass, bottle*; dítàhki . . . *I shell (corn)*; bàhci *child, offspring*; póhča *small fish* (Spanish *perca?*); rà-ʔbɔ̀hthó *she's here*; rá-ʔíhkhį *it cuts*; . . . dà-míh sɛ́hɛ . . . *to sit by himself*; pą̀h nɔ́ *that one (a boy) knows*; míh yá *sit down*; kó-cɔ̀h šó-ʔwą̀ʔ má-núšį *you were awake (?) when it rained last night.*

Analysis to date would indicate that phonological and morphological conditioning preclude the occurrence of H before syllable-initial b, d, g, z, ñ, l, w, ph, and before word-medial š and h. Immediately preceding word-initial ʔ and word-initial h, H does not appear. The phoneme ž and the clusters ch and čʔ are of limited distribution, but in available data we have no examples of H occurring before them.

It seems possible that the final element, i, of the syllable nuclei ei, ɔi, ʌi, ai, oi, ɔi, ąi, ųi (**2.1.2.**) is related to H. At least, in slow forms post-vocalic i is in complementary distribution with H and with root-final n, post-vocalic i appearing syllable-finally in free roots only. Compare the following forms: ʔbɔ̀hthó *to be here, to live here* : ʔbɔ̀i *to be, to live*; ʔmɔ̀hthó *to just stand* : ʔmɔ̀i *stand up!*; dà-hyʌ̀ʔ . . . *it will let drop* (rapid speech) : dà-hyʌ̀i *it will let drop* (slow speech); tàngi *to buy* (object expressed) : tɔ̀i *to buy* (object not expressed); ʔɛngi *to throw, to cast* (object expressed) : ʔei *to throw away* (object not expressed). Compare also the following two forms: hʌ̀hi *to fall, to drop* (intrans.) : hʌ̀i *to cause to fall, to drop* (trans.), where post-vocalic i functions similarly to H in many forms.

3.5.2. The glottal morphophoneme H usually constitutes a morpheme or an alternant of a morpheme. There are at least five morphemes which may have the form H.

-H- is a suffix indicating a transitive verb. Frequently two verb stems which are distinguished by the presence of -H- in one and its absence in the other are morphologically and semantically related. As a rule -H- appears in the transitive form. Consider the following examples: yʌ̀tʔe *to come undone* : yʌ̀ʔtʔe *to take undone*; ší-yʌ̀tʔe mà-ʔbɛ̌; tó-yʌ̀ʔtʔe sɛ́ *my weaving is undone; I took it*

out myself; ʔʌ̀de *to hear, understand* : ʔʌ̀hte *to respect, obey*; dí-ʔʌ̀de *I hear* : dí-ʔʌ̀hte *I obey*; kótʔi *to close* : kóhti *to stop up*; kótʔi kʔà rì-gǒšthi yá *shut your door now* : dí-kóhti mà-šʌ́ni *I mend my water pot* (*stop up a hole*); mógi *to be crooked* : mó̀hki *to do or make crooked*; rá-mògi kʔà ʔñų *the road is crooked* : bí-mò̀hki *she's doing it crooked*.

Rarely, however, H is the phonemic distinction between two unrelated roots, as in dí-pótʔi *I wrap myself* (*in something*), and dí-pʌ́ʔtʔi *I kill* (*something*).

-H may be an alternant of any of the following four stem-formative morphemes: (1) -hi∼-H; (2) (-phi∼-pho)∼-H; (3) ([-di∼-de]∼-H)∼(-ti∼-te); (4) ([-gi∼-ge] ∼-H)∼(-ki∼-ke). But we have a few examples in our data in which the first-order suffix alternates with zero in rapid speech: yǎ bì-bą̌ čí-čʔʌ́ *she already knows a little*, in which bì-bą̌<bì-bą̌di. Either such examples as this are not accurately recorded, or there is a zero alternant of the -H alternant, for at least certain of these suffixes.

The morphemes listed above as (1) and (2) occur only after stems which do not have the -H- suffix indicating a transitive verb. The -H alternant is the common alternant in rapid speech.

In the morphemes listed as (3) and (4), the first set of alternants appears after stems which do not have the -H- suffix indicating a transitive verb; the -H alternant is the common alternant of the first set in rapid speech. The second set of alternants appears after stems which have the -H- suffix indicating a transitive verb.

Note that in none of the above cases does an -H alternant occur following the suffix -H- indicating a transitive verb. We illustrate with examples showing ʔ and h as -H in each of the types of alternation mentioned above. The alternant used in slow speech appears in parentheses after the form with -H.

ʔ=-H as alternant of -hi, -phi, -di, -gi : khà dò-kòʔ (∼dò-kòhi) rì-kú *is your younger sister coming back*?, bì-màʔ (∼bì-màphi) kʔà míngʷa *the cock crowed*, rá-ʔǔʔ (∼rá-ʔǔdi) ró-cìbi *she is lighting her fire*, bì-kʔə́ʔ (∼bì-kʔə́gi) rò-ʔílo *the thread snapped*.

h=-H as alternant of -phi, -de, -gi : rà-hə̌h (∼rà-hə̌phi) nʌ̀ ró-ncə̌ya *her husband is embracing her*, ʔì-kʌ́h (∼ʔì-kʌ́de) nʌ̀ ró-hwítʔwʌ́ *he wears trousers*, ší-kʔə́h (∼ší-kʔə́gi) nʌ̀ ró-nthą̌hi *her yarn snapped*.

While we have no examples of word-final -H versus absence of -H as the phonemic distinction between two utterances, it is conceivable that in some contexts it could be. Compare, for instance, the stem mà *to be long* in the utterance rá-mà kʔà ró-né *his bill* (*mouth*) *is long*, with màʔ, the stem for màphi with the -H alternant, meaning *to crow* (*shout, bellow, etc.*).

CHEROKEE II

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0. Introduction
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0. The present paper is the second in a series of reports on North Carolina Cherokee.[1] It is issued as a preliminary contribution to the study of Cherokee morphology.

The crude data was obtained from two informants. Molly Sequoia dictated the texts and translations in the summer of 1945. Certain of the parallel sequences were derived from collections made by Z. S. Harris and represent the speech of John French. These sequences are marked by asterisks. It should be noted that the two informants represent somewhat divergent dialects of North Carolina Cherokee. The phonemic transcription is that established in the first Cherokee article (fn. 1).[2]

[1] The first: Ernest Bender and Zellig S. Harris, The Phonemes of North Carolina Cherokee, IJAL 12.14-21 (1946).

[2] My work on North Carolina Cherokee was begun in 1944 under a fellowship granted by the American Council of Learned Societies. The gathering and analyzing of the material obtained from Mrs. Sequoia was made possible by a grant from the American Philosophical Society. I take the opportunity here to express my gratitude to the American Council of Learned Societies, to the American Philosophical Society, and to Z. S. Harris for his help and encouragement.

1.1. Basket-game.

anhdasʌdisgi gesʌgi sgina iyúsdi. [(name of game) *it-was that kind.*] adéla zunigáwalhdi. [*money they-used-to-bet.*] dinanelóhnʌsgi. [*they-played.*] gésʌgi anisgʌyáha uwáhsʌ hganigidʌ anígeya. [*it-was men only not-any women.*] anisgʌya uwáhsʌ. [*men alone.*] hdláhno egwa yidanígawadhlásgei. [*not big they-bet.*] adéla uwáhsʌ. [*money only.*] nʌdóweyaahda danhdisgʌgi. [*saw-wood they-used.*] osi dʌniye'lʌha. [*good they-thought.*] zunanélhdi. [*they-played.*]

1.2. Free Translation.

The anhdasʌdisgi was like this. They used to bet money. Only men played. No women. Only men. They did not make big bets. Only money. They used saw-wood (for money). They liked to play.

1.3. Word-List.

adéla *money*, anhdasʌdisgi (name of basket-game), anígeya *women*, anisgʌyáha *men*, anisgʌya *men*.

danhdisgʌgi *they used*, dinanelóhnʌsgi *they played*, dʌniyélʌha *they thought*.

egwa *big*.

gesʌgi *it was*.

hdláhno *not*, hganigidʌ *not any*.

iyúsdi *kind, sort*.

nʌdóweyaahda *saw-wood*.

osi *good*.

sgina *that*.

uwáhsʌ *only* (The informant on one occasion substituted unasʌ.).

yidanígawadhlásgei *they (did not) bet*.

zunanélhdi *they played*, zunigáwalhdi *they used to bet*.

1.4. Morpheme List.

a third person marker: a-nisgʌya *men*,

a-sgʌya *man*, a-nigeya *women*, a-geya *woman*, a-gowahdʌ *he sees*, *a-hnésgeha *he builds*, *a-hdʌgiha *he hears*, *a-ghdaha *he knows*.

d(i) prefix indicating past time: di-nanelóhnʌsgi *they played*, hdláhno egwa yi-d-anígawadhlásgei *they didn't bet big*, d-anhdisgʌgi *they used*, d-ʌniyélʌha *they liked*.

g(a) third person marker: g-esʌgi *it was* (note contraction of a-vowel with the stem i *to be*), yida-gá-nanugoi *he may come up*, ga-wonisgoi *he speaks*, zini-ga-wésgʌgi *it used to sing*, ga-hygógi *he tells a lie*.

gawalh∼gawadhla∼gawahla stem *bet*: zuni-gáwalh-di *they used to bet*, hdláhno ..... yidaní-gawadhlá-sgei *they did not bet*, dani-gáwahla-ga *they bet* (*now*).

gi suffix marking action in past: gesʌ-gi *it was*, danhdisgʌ-gi *they used*, zíghdahʌ-gi *I did know*, zágohʌ-gi *he saw you*, ágwahdʌgánʌ-gi *I heard*, *zinʌ-gi *I fell*, *agigohʌ-gi *I saw*.

hdi∼hd stem *use*: dan-hdi-sgʌgi *they used*, dan-hdi-ha *they use*, zidan-hdí-sgʌgi *they used to use* (*long ago*), dadán-hd-ahni *they will use*.

hdla stem *not*: hdlá-hno *not*, á-hdla yunikaha *they don't have*.

hno suffix: hdlá-hno *not*, osi-hno *good*.

i suffix: hdláhno egwa yidanígawadhlásge-i *they did not bet big*, zaninohesge-i *they used to tell*, danilehdísge-i *they burned* (*a long time ago*), anehʌ-i *they're here*, ziwahdahá-i *I found him*, anigahdahé-i *they knew*.

i stem *be*: gesʌgi *it was* (ga *it*+i+sʌgi), anehʌi *they're here* (ana *they*+i+hʌi), zanéha *they were here* (z+ana *they*+i+ha), eha *person* (a (third person marker)+i+ha), inʌge ehi *wild animal* (inʌge *in the forest*+a (third person marker)+i+ha), *asgʌya gesésdi *he'll be a man* (ga (third person marker) +i+sesdi), *anehái *place where they're living, their country* (ana *they*+i+hʌi), *geái *place where I'm living, my country* (ga (first person marker)+i+ʌi), gesʌi *it was* (ga (third person marker)+i+sʌi).

na∼ni pluralizer of third person marker: dʌ-ni-élʌha *they thought*, a-ni-geya *women*, (cf. ageya *woman*), a-ni-sgʌya *men*, (cf. asgʌya *man*), zu-na-néldi *they played*, *u-ni-nadína *they sold*, (cf. *unadína *he sold*), *u-ni-gohʌgi *they saw*, (cf. *ugohʌgi *he saw*), *a-ni-zilásgi *flowers*, (cf. *azilásgi *thing that blooms*).

neloh∼nelh stem *play*: dina-nelóh-nʌsgi *they played*, zuna-nélh-di *they used to play*, daná-nelóh-nʌsga *they play now*, dodʌna-neloh-ni *they're going to play*, dadʌ-neloh-ni *he's going to play*.

osi stem *good*: osi *good*, osi-yu *good* (osi-yu nunadunadegʌgi *they lived comfortably*), osi-hno *good*, *osi deziyelásga *I think it good*, *udli osi gesesdi *it'll be better*.

sge suffix: hdláhno egwa yidanígawadhlá-sge-i *they did not bet big*, danisdígi-sge-sdi *they will eat*, zaninohe-sge-i *they used to tell*, danilehdí-sge-i *they burned* (*a long time ago*).

sgi suffix: dinanelóhnʌ-sgi *they played*, hganohe-sgi *it tells*, gosʌ-sgi *he made*, *azilá-sgi *thing that blooms* (*flower*).

sgʌ suffix: danhdi-sgʌ-gi *they used*, zidanélohnʌ-sgʌ-gi *they played*, ananezóʌ-sgʌ-gi *they were playing ball*, zidanhdí-sgʌ-gi *they used to use* (*long ago*), nigawe-sgʌ-i *it sang*, yidagayái-sgʌ *he may be coming*, nigawe-sgʌ *when it sings*, zinigawé-sgʌ-gi *it used to sing*.

sʌ suffix: ge-sʌ-gi *it was*, agwenʌ-sʌ-gi *I went*, digwenʌ-sá-i *at my home*, ahni agwenʌ-sá-i *I live here*, *agilogé-sʌ-i *my farm, my field*, *dazilí-sʌ-hi *I'll take stick out*, *agihyá-sʌ-gi *I did carry*.

u third person marker: u-yelʌha *he thinks*, u-niyelʌha *they think*, u-nodena *sheep*, u-ni-nodena *sheep* (pl.), u-zi *his mother*, ú-nizi *their mothers*, u-yelhdi *it means*, u-niyelʌhdi *they mean*.

yelʌ stem *thinks:* dʌni-yélʌ-ha *they thought*, uni-yélʌ-hʌgi *they thought* (*long ago*), u-yél-ha *he thinks*, uni-yélʌ-ha *they think*, *osi deziyelá-sga *I like it, I think it good*.

yi∼y prefix indicating possibility: Áhdla y-unikaha *they don't have*, Áhdla kilói y-agahdaha *no-one knows*, yi-dagánanugoi *he may come up*, yi-ziwahtahoga *he may see you*, *Áhdla yi-dunihlʌnoi *they never sleep*, *y-azíhnogayigi *I may bring it*.

zi∼z prefix indicating continued action in past (*a long time ago*): zi-daniléhdisgʌgi

they used to burn, zi-danhdísgʌgi *they used to use*, z-aninohésgʌgi *they used to tell*, z-ánehʌgi *they were*, z-unigáwalhdi *they used to bet*, z-unanelhdi *they used to play*.

2.1. Dance- and Ball-Games.

anahnezóʌsgi alhsgalhdi unásʌ. [*ball-team ball alone.*] unazeliga ustiga alhsgalhdi. [*their small ball.*] anadisgói ahséhno usgwanighdiyu nasgi iyúsdi gesʌi. [*they-said then spectacle that like it-was.*] zóasgohigwʌ nadehdiya zigesʌgi. [*30 years it-was.*] anahnezóʌsgʌgi. [*they-played-ball.*] ahsdáya duniláwisdanehʌgi. [*hard they-worked.*] adonisgi unihgahoi ale gosʌsgi náwohdi unélagi gesʌi. [*conjure-man they-had and he-made medicine other it-was.*] unélagi dihganogisgi analhsgisgʌi anisgʌya. [*other singers dancers men.*] unélagi anigehiya dihganogiehi. [*other women singers.*] nagwu analenisgói uhlsinide. [*now they-began late-in-the-evening.*] nagwu uhdlza dagwadʌ ánalisgísgoi. [*now night all they-danced.*] iga nagwu ananigisgoi asgohi iyuzilódʌ yigesʌi hilʌhiyʌda ale dahnawʌ usoyigwʌ anighdaha. [*daylight now they-went 10 miles maybe-it-was longer and war same they-knew.*] unalhsdélhdodi. [*they-conjured.*] zinanía zunadalenʌda aniyʌwiyahi gesʌi unalhsdelhdodi. [*all different Indians it-was they-conjured.*] unasʌ gesʌi unalhsdélhdodi. [*alone it-was they-conjured.*] uniha hiahno amayeli anehi. [*they-have now American they-are.*] nagwu anahnezóʌsgi nagwu igayi. [*now they-played-ball now at-daylight.*] gawonisgoi adáwisgi degawónisgoi anahnezóʌsgi nagwalegwu náwohdi unadíhdasdi nagwu yadanáhnezóni iyani anahnezóʌsgi uwáhsʌ. [*he-spoke conjure-man he-talked-to-them ball-team first medicine they-drink now when-they're-going-to-play many ball-team alone.*] nagwu dánigawahdlasgoi naniʌi ale yúwanega dánigawahdlásgoi adela ale hayelasdi. [*now they-bet everybody and white-man they-bet money and knife.*]

2.2. Free Translation.

The ball-team used only one ball—a small one. They said that that sort of a game was something to see. Thirty years ago when they played ball they worked hard. They had a conjure-man and a medicine-man, too. There were men singers and dancers and women singers. They began late in the evening and danced all night. By daybreak they went ten miles—maybe more. And they conjured the same as they conjured for war. All the different Indians conjured for themselves. Now the American Indians conjure at daybreak. When they play ball the conjure-man speaks to the ball team. Before they play they drink medicine—the ball-team alone drinks. Then everybody bets; and the white-man bets money and knives.

2.3. Word-List.

adáwisgi *conjure-man*, adela *money* adonisgi *conjure-man* ahsdáya *hard* ahséhno *then* alhsgalhdi *ball* ale *and* amayeli *American* anadisgoi *they said* anahnezóʌsgi *they played ball, ball-team* anahnezóʌsgʌgi *they played ball* analenisgói *they began* analhsgisgʌi *dancers* ánalisgísgoi *they danced* ananigisgoi *they went* anehi *they are* (*here*) anigehiya *women* anighdaha *they knew* anisgʌya *men* aniyʌwiyahi *Indians* asgohi *10*.

dagwadʌ *all, entire* dáhnawʌ *war* dánigawahdlasgói *they bet* (*past*) degawónisgoi *he talked to them* dihganogiehi *singers* dihganogisgi *singers* duniláwisdanehʌgi *they worked*.

gawonisgoi *he spoke* gesʌi *it was* gosʌsgi *he made*.

hayelasdi *knife* hiahno *now* hilʌhiyʌda *longer, farther*.

iga *daylight* igayi *at daybreak* iyani *many* iyúsdi *kind, sort* iyuzilódʌ *miles*.

nagwalegwʌ *first* nagwu *now* (iga nagwu *till daylight*) nadehdiya *years* naniʌi *everybody* nasgi *that* (pronoun) náwohdi *medicine*.

uhdlza *night* uhlsinide *late in the evening* unadíhdasdi *they drink* unalhsdélhdodi *they conjured* unásʌ *alone* unazeliga *their* unélagi *other* uniha *they have* unihgahoi *they had* usgwanighdiyu *spectacle* usóyigwu *same* ustiga *small* uwáhsʌ *alone*.

yadanáhnezóni *when they're going to play* yigesʌi *maybe it was* yúwanega *white*.

zigesʌ́gi *it used to be, since, ago* zinanía *all* zóasgohigwʌ *30* zunadalenʌda *different.*

2.4. Morpheme List.

a third person marker: a-nahnezóʌsgi *ball-team,* a-nahnezóʌsgʌgi *they played ball,* a-lhsgalhdi *ball,* a-nadisgói *they said,* a-donisgi *conjure-man,* a-nalhsgisgʌi *dancers.*

asgohi stem *10*: zó-asgohi-gwʌ *30,* asgohi iyonida *10 bears,* asgohi iyuzilódʌ *10 miles.*

dale stem *different*: zuna-dale-nʌda aniyʌwiyahi *different Indians,* zuna-dalenʌda selu *different kinds of corn,* zoi nudale-ha *three different* (*kinds*), ú-dale-hi *different* (sg.).

dehdi stem *year*: zóasgohigwʌ na-dehdi-ya *30 years,* sú-dehdi-yʌ́da *one year,* zʌ-déhdi hilóda *how many years?*

di stem *use:* ana-di-sgoi *they used,* dan-di-sgei *they used* (*long time ago*).

dihda stem *drink*: una-díhda-sdi *they drink,* daga-díhda-hi *I drink,* dayoh-sdadihdahi *we two will drink.*

doni stem *conjure*: a-doni-sgi *conjure-man,* ana-doní-sgi *conjure-men, they conjured,* anadóni-ha *they conjure* (*now*).

g(a) third person marker: gesʌi *it was* (ga+i *be*+sʌi), zigesʌ́i *it used to be* (*ago*) (zi+ga+i *be*+sʌi), gosʌsgi *he made* (ga+usʌ+sgi), ga-woniha *he speaks* (*now*), da-ga-wónisi *he will speak.*

gawahdla stem *bet*: dáni-gawahdla-sgói *they bet* (past).

ghda stem *know*: ani-ghda-ha *they knew,* ani-ghda-hʌgi *they knew,* yani,-ghda-ha *they don't know.*

gi suffix indicating past time: zigesʌ́-gi *it used to be* (*ago*), gesʌ-gi *it was,* zighdahʌ-gi *I did know,* anahnezóʌsgʌ-gi *they were playing ball,* dunilʌ́wisdanehʌ-gi *they worked,* *zinʌ-gi *I fell.*

ha suffix: anighda-ha *they knew,* ádi-ha *she says,* anadoní-ha *they conjure now.*

hga stem *have*: uni-hga-hoi *they had,* dagihgá-hʌgi *I had,* uwá-hga-ha *he has it.*

hilʌ∼hila stem *far, much*: hilʌ-hiyʌda *longer,* hilʌ-hiyuhi *long time ago,* hilʌ-hiyu *long time,* hilʌ *far,* hila-ni *far, way out,* hila nadétiya gágʌlizʌ́gi *I've been here many years,* hilʌ-hi iyonida *many bears.*

hnezo stem *play*: ana-hnezó-ʌsgi *ball-team,* ana-hnezó-ʌsgʌgi *they played ball,* yadaná-hnezo-ni *when they're going to play ball.*

hno suffix: ahse-hno *then,* osi-hno *good,* hdlá-hno *not,* hia-hno *now.*

i stem *be*: gesʌi *it was* (ga (third person marker)+i+sʌi), zigesʌgi *it used to be* (*ago*) (zi+ga (third person marker)+i+sʌgi), anehi *they are here* (ana *they*+i+hi).

i suffix indicating past time: andisgó-i *they said,* gesʌ-i *it was,* unihgaho-i *they had,* analenisgó-i *they began,* ananigisgo-i *they went,* ánalisgisgo-i *they danced.*

iga stem *daylight*: iga-yi *at daylight,* iga-hiyu *daylight.*

leni∼len stem *begin*: ana-leni-sgói *they began,* ana-leni-ha *they begin* (*now*), ana-leni-hi *they will begin.*

lhsdelhdo stem *conjure*: una-lhsdélhdo-di *they conjured, conjure-men,* a-lhsdélhdo-di *conjure-man.*

lhsgalhdi stem *ball*: a-lhsgalhdi *ball,* di-lhsgalhdi *balls.*

lhsgi∼lisgi stem *dance*: ana-lhsgi-sgʌi *dancers,* ana-lhsgi *they dance* (*now*), dʌna-lhsgi-si *they will dance,* ána-lisgí-sgoi *they danced.*

lʌwisdane stem *work*: duni-lʌ́wisdane-hʌgi *they worked,* du-lʌ́wisdane *he is working,* widu-lʌ́wisdané-ha *he is working over there.*

na∼ni pluralizer of third person: a-na-hnezoʌsgi *ball-team,* a-na-hnezóʌsgʌgi *they played ball,* u-na-zeliga *their,* na-dehdiya *years,* du-ni-lʌ́wisdanehʌgi *they worked,* u-ni-hgahoi *they had.*

nani stem *all* (cf. na∼ni pluralizer): zinaní-a *all,* nani-ʌ́i *everybody.*

nigi stem *go*: ana-nigi-sgoi *they went,* ananigi *they started out* (*just now*).

nogi stem *sing*: digha-nogi-sgi *singers,* dihga-nogi-ehi *singers,* dini-nogí-sgi *singers.*

sgohi stem *10*: zóa-sgohi-gwʌ *30,* zosgohi *30,* sgohi *10,* hdali-sgohi *20,* nʌsgohi *40.*

u third person marker: u-nazeliga *their,* u-nihgahoi *they had.*

uhls stem *evening*: uhls-inide *late in the evening*, uhls-ʌ́hi *night* (cf. uhdlza *night*).

woni stem *speak*: ga-woni-sgoi *he spoke*, dega-wóni-sgoi *he talked to them*, ga-wóni-ha *he speaks (now)*.

ya∼yi∼y prefix indicating possibility: yi-gesʌi *maybe*, yi-gadoga *he may be here*, ʌ́hdla y-unihgaha *they don't have*, ya-danánezóni *when they're going to play*.

yuwanega stem *white*: yuwanega asgʌya *white-man*, áni-yuwanega anísgʌya *white-men*.

yʌwi stem *person*: ani-yʌwi-yahi *Indians*, *nigadʌ yʌ́wi *all the people*.

zeli stem *possession*: una-zeli-ga *their*, agwa-zeli-ga *I've got it, it's mine*.

zi∼z prefix indicating past time: zi-gesʌ́gi *it used to be*, zi-danhdisgʌgi *they used to use*, z-unanelhdi *they used to play*.

zo stem *3*: zó-asgohigw *30*, zó-asgohi *30*, zo-i *3*, zo-gadu *13*, zo-izuhwi *300*.

3.1. Basket-Game.

hiáhno dihgwaniyosdi. [*this* name of game).] hilʌhiyuhi aniyʌwiyahi anehe egwohu zunigawadhlʌ́nahi inage ehi. [*long-time-ago Indians people big they-used-to-bet forest animal.*] gohiniyúzigi nigesdi sgina iyusdi. [*now not that kind.*] zunhdánayigi selu ugʌwayuhéi danhdiske hilʌhiyu zaneha. [*big corn that-kind they-used long-time-ago people.*] súdaliga danoyéskei ságwo izu. [*6 they-burned one side.*] nole hiláhiyu hduyanegwa higésʌi zunhdana hduyanegwa. [*and long-time butter-beans they-were big butter-beans.*] gohihnóiyʌzigi hzahno uzíiga nasgi iyúsdi yinanadʌneha aniyʌwiyahi digadlhsdódiha aniwazina ugʌwayuha dégeyʌhʌsga udale. [*nowadays not more that kind they-do Indians because government way it-teaches-them different.*] diniyóhli hganigidʌ uzi gesʌ́i sgiyu zunanélhdi gesʌ́i gohiyʌ́da yaníghdaha. [*children nothing more it-was that they-used-to-play it-was not they-don't-know.*] diniyóhli gohiyʌ́da dʌnhdʌsidisʌ́i. [*children now they're grown-up.*] hilʌhiyu zúdalenaha. [*long-ago different.*] uhso nagwu agieláha. [*bad now I-guess.*] nigáda hia nasgi iyúsdi dagaliwo. [*all this that kind it-will-die-out.*] hza nagwu nigáda nasgi iyúsdi dinélhdi. [*not now all that kind games.*] digesʌ́i. [*it-is-finished.*]

3.2. Free Translation.

This is the Basket-game. The Indians who were here a long time ago used to make big bets—(they would bet) wild animals. Nowadays it's not like that. The people of long ago used big corns. They took six corns and burned them on one side. Then afterwards, (they used) butter-beans—big butter-beans. Nowadays, the Indians don't do that any more because the government teaches the children differently. Now the children are grown up (and it is) different from long ago. I think it's bad. All this sort of thing will die out. These games will no longer be. End of account.

3.3. Word-List.

agieláha *I guess* anehe *people, they were here* aniwazina *the government* aniyʌwiyahi *Indians*.

dagaliwo *it will die out* danhdiske *they used* danoyéskei *they burned* dégeyʌhʌsga *it teaches them* digadlhsdohdiha *because* digesʌ́i *it is finished, it was* dinélhdi *games* diniyóhli *children* digwaniyosdi (name of basket-game) dʌnhdʌsidisʌ́i *they're grown up*.

egwohu *big* ehi *animal, creature*.

gesʌ́i *it was* gohihnóiyʌzigi *nowadays* gohiniyúzigi *now* gohiyʌ́da *now*.

hduyanegwa *butter-beans* hganígidʌ́ uzi *nothing more* hia *this* hiáhno *this* higésʌi *they were* hilʌhiyu *long time ago* hilʌhiyuhi *long time ago* hza *not* hzahno *not*.

inage *in forest* (inage ehi *forest animal, wild animal*) iyusdi *kind, sort* izʌ *side*.

nagwu *now* nasgi *this* nigáda *all* nigesdi *not* (?) nole *and*.

ságwo *one* selu *corn* sgina *that* sgiyu *that* súdaliga *six (things)*.

udale *different* uguwayuhei *that kind* (?) ugʌwayuha *way* (?) uhso *bad* uzíiga *more*.

yaníghdaha *they don't know* yinanadʌneha *they use*.

zaneha *the people, they used to live (here)*

zúdalenaha *different* zunanélhdi *they used to play* zunhdana *big* zunhdánayigi *big* zunigawadhlánahi *they used to bet.*

3.4. Morpheme List.

agi first person marker: agi-eláha *I think*, agi-wahdʌhʌgi *I found it*, agi-héhi *my husband.*

d prefix marking action in past: d-anhdiske *they used*, d-anoyeskei *they burned.*

di pluralizing prefix: di-niyóhli *children*, dí-nadónisgi *conjure-men*, *di-hnuwo *shirts*, *di-gwahnuwo *my shirts*, *di-lasgálhdi *balls* (cf. ayóhli *child*, adonisgi *conjure-man*, *ahnuwo *shirt*, *alasgálhdi *ball*).

dʌne stem *do*: hzahno . . . . . yinanadʌ́ne-ha *they don't do*, na-dʌ́ne-ha *he does*, nana-dʌ́ne-ha *they do*, nana-dʌ́ne-hʌgi *they used to do.*

egw stem *big*: egw-ohu *big*, egw-a *big.*

el stem *think, guess*: agi-el-ʌ́ha *I guess*, h-el-iʌ *he guesses*, hagi-el-a *I guessed* (*a long time ago*).

ga third person marker: da-ga-liwo *it will die out.*

gawadhl stem *bet:* zuni-gawadhlʌ́-nahi *they used to bet* (*long ago*) (see gawalh in **1.4.**

ghda stem *know*: yanʃ-ghda-ha *they don't know.*

gohi stem *now:* gohi-niyúzigi *now*, gohí-iga *today*, gohi-suŋalei *this morning*, di-gohi-le ziliha *I sleep all the time*, gohi-hnóiyʌ́zigi *nowadays.*

hdʌsi stem *grow up*: dan-hdʌsi-disʌ́i *they're grown up*, dʌna-hdʌ́si-di *they're growing up* (cf. u-hdʌs-onʌhi asgʌya *old man*).

hia stem *this*: hia *this*, *he*, hia-hno *this.*

hilʌ stem *long, far*: hilʌ-hiyuhi *long time ago*, hilʌ-hiyu *long time ago.*

hno suffix: hia-hno *this*, hdlá-hno *not*, asehno again, gohi-hnó-iyʌ́zigi *nowadays.*

hza stem *not*: hza-hno *not*, hza *not.*

i stem *be*: inʌge anehi *wild animals* (ana *they*+i+hi), inʌge ehi *wild animal* (a (third person marker)+i+hi), zaneha *the people of long ago* (*they used to be here*) (z (prefix marking act in past)+ana *they*+i+ha), zeha *person of before* (*he used to be here*) (z+a (first person marker)+i+ha).

iz stem *side*: sagwo iz-ʌ *one side*, iz-ala iz-ʌ *both sides.*

liwo stem *die*: daga-liwo *it will die out*, *u-lihwó-zʌgi *it died* (*in past*).

nelh stem *play*: zuna-nélh-di *they used to play*, di-nélh-di *games.*

na∼ni third person pluralizer: inʌge a-ne-hi *wild animals* (a (sg. third person)+na+i+hi) (cf. inʌge ehi *wild animal*), di-niyóhli *children* (cf. ayóhli *child*).

nole stem *and*: nole *and*, zani nole-gwo meli *Johnny and Mary.*

oye stem *burn*: dan-oye-skei *they burned*, dan-oye-ha *they burn* (*now*).

suda stem *6*: suda-liga *6 things*, sudasgóhia *60*, zaneha suda-li iyanii *6 people.*

udale stem *different*: udale *different*, z-udale-naha *different.*

uzi stem *more*: uzí-ga *more*, hganígidʌ uzi *nothing more.*

y∼yi prefix marking possibility (note use with negatives): y-anighdaha *they don't know*, hzahno . . . . yi-nanadʌneha *they don't do.*

yohli stem *little*: dini-yóhli *children*, a-yóhli *child*, ga-yóhli-yigi *little.*

yʌwi stem *person*: ani-yʌwi-yahi *Indians.*

z∼za prefix indicating action in past: z-unigawadhlʌnahi *they used to bet*, z-aneha *people of long ago, they used to live here*, z-eha *person of long ago, he used to be here.*

zʌnhdan stem *big*: zʌnhdan-áyigi *big*, zʌnhdan-ída *biggest*, zʌnhdan-a *big.*

ALTERNATE PHONEMIC ANALYSES OF COMANCHE

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0. Introduction
1. Consonants: Analysis A
2. Consonants: Analysis B
3. Discussion
4. Vowels
5. Stress

0. This paper presents two alternate phonemic analyses of the consonants of Comanche, a Uto-Aztecan language.[1] The question involved is whether the sequence h plus consonant should be regarded as a consonant cluster or as a unit phoneme in this language.[2] In section 3 the relative advantages and disadvantages of each solution will be discussed without any attempt to favor either analysis. The writer, however, prefers analysis B.

1. Consonants: Analysis A. In this analysis the sequence h plus consonant is interpreted as a consonant cluster.

1.1. Stops and spirants generally occur in unique allophones, namely voiceless; h is assimilated to preceding vowels and following nasals.

Stops: p, t, c (an affricate, patterning as stop), k^w, k, ʔ. Examples: paa *water*, picipə *milk*, tɘaʔ *son*, peetə *daughter*, caatə *good*, paciʔ *little sister*, k^weeвiʔ *pointed hill*, tənik^{w}ərə *singing*, kookoʔ *hen*, tokoʔ *grandfather*, ʔaraʔ *uncle*, moʔO *hand*.

Spirants: s, h. Examples: sariiʔ *dog*, kesautə *wicked*, hiipI *drink*, pahaʔ *aunt*.

1.2. Oral and nasal sonants are voiceless before voiceless vowels, only slightly voiced following h, fully voiced elsewhere.

Oral sonants: w, в, r, y. In intervocalic position, w and y have idiolectal variants gw and dž respectively. The phoneme в is a bilabial fricative; r an alveolar flap. Examples: waʔooʔ *cat*, ʔawO *cup*, təвicI *very*, naiвiʔ *young lady*, tərəʔaitə *working*, karərənəʔ *I am sitting*, yakeetə *crying*, təhəəyA *pony*.

Nasal sonants: m, n. Examples: miʔarə *going*, kimA *come!*, nə-rəaʔ *my son*, səsəʔanA *sometime*.

1.3. The distribution of the consonants according to analysis A is as follows:

All consonants occur in utterance medial.

The phonemes в and r occur in word initial but not in utterance initial.[3] All other consonants occur in utterance initial.

Only ʔ and h occur in utterance final.

Consonants occur in the following clusters, which appear only in utterance medial:

h + p, t, c, k^w, k, w, r, m, n
ʔ + n, r
n + h

2. Consonants: Analysis B. In this analysis the sequence h plus consonant is inter-

[1] The data on which this paper is based was gathered during the 1948 session of the Summer Institute of Linguistics at the University of Oklahoma. Comanche informants were Molly Weryavah, Emily Riddles, and Mrs. Joe Harry. I am indebted to C. F. Voegelin for suggestions in the presentation of the material.

[2] A third possible analysis, that of interpreting preconsonantal h as a voiceless vowel has not been considered due to the fact that Comanche voiceless vowels are contrastive as to quality, while the phoneme h is not. See section 1.1., Spirants.

[3] The phonemes в and r alternate morphophonemically with p and t respectively. Conditions of alternation are not always phonologically defined. Cf. nə-rəaʔ *my son*, ʔə-tɘaʔ *your son*. In utterance initial position, however, v and r are always replaced by p and t respectively, and r is always replaced by t following i.

preted as a unit phoneme, i.e. a preaspirated consonant.

2.1. Consonants which show an opposition of preaspirate versus simple are certain stops and continuants. The stops always appear voiceless; the preaspirate continuants are only slightly voiced, the simple continuants are voiceless before voiceless vowels, voiced elsewhere.

The stops are:

Preasp. ʻp, ʻt, ʻc, ʻkʷ, ʻk

Simple p, t, c, kʷ, k

Examples: ʔaʻpəʔ *father*, kaʻpeʔ *bed*, ʔəʻtui- *to give (sing.)*, moʻtoʔA *pimple*, tuneʻci- *to run*, paʻcikeetə *slick*, yaʻkʷi- *to say*, təʙəcaʻkʷeyaʔi- *to skin*, təʻka- *to eat*, naʻkia *maybe*, pahaʔ *aunt*, tamiʔ *little brother*, caatə *good*, kʷiipə *smoke*, kakuʔ *grandmother*.

The continuants are:

Preasp. ʻm, ʻw, ʻn, ʻr

Simple m, w, n, r

Examples: naʻmeitə *table*, kaʻnI *house*, taʻniʔikI- *to put (with plural object)*, wokoʻwiʔ *squirrel*, puhiʻwI *money*, noʻrənapI *bed*, ʔuʻri- *third person obj. dual*, marəaʻweʔ *greeting*, waʔooʔ *cat*, naramaʔipA *story*, karərə *sitting*.

2.2. Remaining consonants are those consonants in analysis B which do not show opposition of presapirate versus simple. Their allophones are as described under analysis A.

Stop: ʔ. Examples: miʔarə *going*, ʔaraʔ *uncle*.

Continuants: ʙ, s, y, h. Examples: ʔonaʙiʔ *salt*, muʙipóroʔ *pig*, sariiʔ *dog*, sahopA *broth*, yəʻkʷi- *to say*, təhəəyA *pony*, haicI *friend*, pahaʙitə *swimming*.

2.3. The distribution of consonants under analysis B is as follows:

All consonants occur in utterance medial.

All simple (i.e. non-preaspirate) consonants except ʙ and r (as explained in section 1.3.) occur in utterance initial.

Only ʔ and h occur in utterance final.

There are only three consonant clusters. Two with glottal stop as prior member (ʔn, ʔr) and nh; these occur in utterance medial.

3. Discussion. Analysis A presents fewer phonemes but more consonant clusters than does analysis B. Yet analysis B, while introducing nine new phonemes, making a total of twenty-three consonants instead of the fourteen afforded under analysis A, presents an interestingly symmetrical system, with oppositions totally lacking under analysis A.

Following analysis A, morpheme boundaries occur between h and a following consonant. This is the case with the form ʔuhri- *third person dual, object out of sight*, where -h- is a dual marker. Under analysis B dual would be marked here by preaspiration. It has been suggested in interpreting other languages that an adequate description is one which permits morpheme boundaries which do not necessarily coincide with phoneme boundaries. An example of this is found in Oaxaca Chontal, where in some instances the third person marker consists of palatalization.[4] Nevertheless, the theoretical advantages and disadvantages remain to be argued.

According to analysis B, one may set up a series of morphophonemic alternations of simple with preaspirate consonants. In adjectives, a simple consonant may be replaced by its corresponding preaspirate in reduplicated forms. cf. paʔatə *long*, paʻpaʔatə *long(redup.)*. In verbs, a preaspirate consonant may be replaced by its corresponding simple consonant in certain formations. cf. t karuʔi-n ʔ *I shall eat* (stem təʻka-), təkəʙənanəʔ *I was eating* (alternate stem təkə).

The phonemic system of Comanche under analysis A seems to correspond more closely to the phonemic systems of the other Uto-Aztecan languages than does the system proferred under analysis B. The phonemes of Proto-Uto-Aztecan apparently had no such double series of consonants as would result from the postulation of a series of preas-

[4] Viola Waterhouse, Learning a Second Language First, IJAL 15.106–109 (1949).

pirate consonants, while consonant clusters are not at all rare in the Uto-Aztecan language family. Comanche preaspirates may correspond to simple consonants in cognate languages. cf. So. Paiute yəŋə, Com. yə'nə? *porcupine*; Tübatulabal tək-, So. Paiute təq.a, Com. tə'ka- *to eat*; So. Paiute qan.i-, Tübatulabal hani, Com. ka'nI *house*; So. Paiute ap.əi-, Com. ?a'pəi- *to sleep (sing.)*; So. Paiute aq.ɔi-, Com. ?ə'ko?i- *to sleep (pl.)*.

4. Vowels. Only one analysis is presented for the vowels; these are voiced and voiceless.

Voiced: i, e, a, o, u, ə. Vowel ə is a high, unrounded vowel varying from central to back position. Vowels i, e, o, u vary from close to open varieties; a varies to [ʌ] in unstressed position. Examples: piapə *big*, tena'pə? *man*, papI *hair*, sonipə *grass*, hunuBI *creek*, wənə-nə? *I stop*.

Voiceless: I, E, A, O, U, ə. These are of the same quality as their corresponding voiced vowels. In normal speech, utterance medial ə appears somewhat shorter than other voiceless vowels.[5] Examples: ?ekaBItə *red*, hayarokʷEtI *four (as used in counting)*, sahopA *broth*, səəmanUrii *ten (used as object)*, mo?O *hand*, təkəBənitə-nə? *I keep on eating*.

The distribution of the vowels is as follows:

All vowels occur in utterance medial.

Only voiceless vowels and vowel clusters occur in utterance final. When a morpheme with a final single voiced vowel occurs in utterance final position its final vowel is replaced by a voiceless vowel of corresponding quality.

Only voiced vowels occur in clusters. These are of two members, which may consist of identical or diverse vowels. All voiced vowels occur in identical clusters. Examples: tiipE *mouth*, kʷeeBi? *pointed hill*, caatə *good*, kooBe? *face*, huupI *tree*, pəərA *arm (wrist to elbow)*. The following clusters of diverse vowels have been observed: a, u, e, o followed by i. kasaráiBo? *angel*, pui *eye*, na'meitə *table*, kookʷa?ənoi *egg*, i, ə, o followed by a. piapə *big*, təasə *again*, moakU *lots*. ə, a followed by e. nəetə *wind*, pae *water (obj.)*.

5. In the examples given above stress is unmarked when it falls on the first syllable of a word; in all other cases it is marked.

[5] This fact has given rise to still another interpretation of Comanche phonemes: namely that of considering voiceless, when occurring in medial position, as aspiration of the preceding consonant. See Henry Osborn and William A. Smalley, Formulae for Comanche Stem and Word Formation, IJAL 15.93-99 (1949), where the form təkəbənitu-?i-nə? *I will always be eating*, is transcribed [tĭkʰ-bĭnitu?i-nĭ?]. This interpretation admits of a few more consonant clusters, but these are much less frequent in occurrence than the type h plus consonant, with which we are concerned.

GOAJIRO (ARAWAK) IV: TEXTS[1]

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Text I
Free translation of Text I
Text II
Free translation of Text II

Text I—The Old Woman's Ghost (AO)

1. a'unuši piamaši himo'on·u huma pe'-ke·ra huči·rua pəli·ku wa··t·aməī [*they-went* (**16.2**) *two* (**9.4**) *girls* (from sing. himo'ol or himo'otsə) *in-order-to search* (**17.3**) *for* (**22.3**) *a-donkey very-far* (**5.11**)]. 2. nantaka' aka hi·rakuməī wane la· e·ka'aka wašin·əirua na'pula [*when-they-came* (**24.2**) *to* (**22.3**) *a* (**9.3**) *lake there-were* (**20.1** (4), **24.2**) *rich-people* (**8.3**) *opposite-them* (**22.2** (4))]. 3. nasak·in·aka'aka na'tuma [*they-were-asked* (**18.5, 24.2**) *by-them* (**22.5**)]. 4. "han·ə kačauni·ka hia?" nu·maka'aka [*whose daughters* (*are*) *you* (**10.6** (1)) *he-said* (**15.5**)]. 5. "nučõ waših. močohušihasa pa'u waših?" [(*we-are*) *his-children* (**7.10, 7.12** (1)) *our-father does-not-recognize* (negative interrogative form; **19.3**) *thy-eye* (**7.12** (2 a)) *our father*]. 6. "ã nayata kačõka hia Emi·lio?" [*oh-yes* (**25**) *will-it-be-they* (**10.2**) *daughters* (**7.10**) *you* (**10.1**) *Emilio*]. 7. "ã nia aya" [*yes he* (**10.1**) *it-is*]. 8. "hiaka hahəčahaī ačiki puli·ku?" [*you* (**10.1**) *search* (**15.1**) *for* (**22.1**) *a-donkey*]. 9. "ã ya·siə kasə·ləī yaya·" [*yes it-is-here* (**20.1** (1)) *where-(they-)drink* (**7.19** (6)) *here* (**21.2**)]. 10. "anata·s werahawe·rəī wat·a·" [*it-will-be-good* (**10.2**) *that-we-shall-go-and-look-for-it* (**14.1, 15.2**) *to-morrow* (**21.3**)]. 11. a'unuši ya·lapa kaih-kaih ya·la [*they-went when-inclining* (**24.2**; cf. kaihkaih ya·lal *the sun is low*) *the-sun* (**7.6** (3)) *in-the-evening* (**21.3**)]. 12. alač·i hə'ətpəna wane amauyu [*they passed* (**16.2**) *past* (**22.1, 22.2**) *a cemetery*]. 13. nantaka'aka hulu'uməī luopko e·ka'aka tia hoyot·əī hən(aī) a'oha· aulak wane hintəih huma [*when-they-came into* (**23.1, 23.2** (2)) *an-arroyo* (**5.6, 7.6** (4)) *there-was that-one* (**10.3**) *sitting* (**14.1**) *in-order-to bathe* (**17.3**) *and* (**24.1**) *a boy with-her* (**22.2** (2))]. 14. naša·wale·raka'aka hə'ətpa'a "kačõyas he· atap-(ə)ri·ska?" na·maka'aka [*when-they-let-her* (*the donkey*)*-ascend* (**18.1** (3), **24.2**) *past-*(*away from*)*-her* (**22.1**) *is-it-bearing-fruit?* (**20.4** (1), **19.4**) *also* (**21.4**) *the-cotupris* (a native tree) *they-said* (**15.5**)]. 15. kauktəs naulia [*she-was-silent from-them* (**22.2** (5))]. 16. wayu·ya če· e·rahã yo·luha·taka e·rahã na·maka'aka hən(aī) a'una· [*an-Indian* (**19.4**) *I-wonder* (**19.4**) *perhaps* (**21.4**) *would-it-be-a-devil* (**10.2, 19.4**) *perhaps they-said* (**15.5**) *as-they-went* (**17.3**)]. 17. nali·kiraka' aka i·punaməī nuhutu·ka'aka puli·kukaih na·ma· [*when-they-made-ascend* (**18.1** (3)) *upward* (**22.1**) *he-fell* (**24.2**) *the-donkey* (m) *with-them* (**22.2** (2))]. 18. nu·puna·kakairua nohoš atamaī pəli·kukaih na·ma· [*when* (*they were*)*-below-him* (**22·2** (6), **7.8** (2)) *he-did-not-rise* (**19.1**) *the-donkey with-them*]. 19. ohuita·či (ohuitahaši?) nu·punahe· [*they-came-out* (cf. **16.2, 16.6**) *from-below-him* (**22.2** (6), **23.1**)]. 20. nairaka·ka'aka humaī tia ne·rakarpa·la (= nairakatpa·la?) nohotka' aka nerəī [*when-they-looked* (**18.2**) *for-her* (**23.2** (2)) *that-one which-they-had-seen-before* (11, **16.2, 16.7**) *she-was-not-there* (**20.2**) *they-saw* (**15.1, 19.1**)]. 21. kaimpuse'ekakairua naput·aka'aka puli·k·aih [*as-they-feared* (cf. kaimpuse'e *fear* (Spanish miedo)) *they-left* (**24.2**) *the-donkey*]. 22. nasanaī təri·aka na·lə'əhaī nawat·a·ka'aka pi·čpa'aməī [*they-took-away* (**15.1**) *the-mat* (*cover*; Spanish

[1] Parenthetic numbers in roman, given with the literal translations of these texts, make reference to the boldface sectional numbers of the preceding parts of the Goajiro (Arawak) study in IJAL volume 15: sections **1** to **5** in part I, pp. 45–56; sections **6** to **10** in part II, pp. 110–20; sections **11** to **25** in part III, pp. 145–57 (1949).

esterilla) *they-brought-it* (**15.1**; from alə'əha·) *as-they-ran* (**24.2**) *into-the-direction-of-the-house* (**23.1**; pi·čpa'a probably equals *the direction of the house*)]. 23. na'kəhaka'akã nantaiwaya "kasap·alahat če· era werəī?" [*when-they-told-it* (**24.2**) *when-they-came* (**24.2**) *the-reason-why* (**7.6** (3), Note 46) *I-wonder* (**10.7**) *perhaps* (**21.4**) *did-we-see-it* (**15.1**)]. 24. "wayu· auktse·ra kasap· ulahatsa" [*Indians* (**7.10**) *will-die* (**7.2, 16.5**) *is-why*].

Free translation. 1. Two girls went to search for a donkey very far. 2. When they came to a lake, there were some well-to-do people in front of them. 3. They were greeted by them. 4. "Whose daughters are you?" one of them said. 5. "The children of our father. Do you not recognize our father?" 6. "Oh yes, would it be the daughters of Emilio?" 7. "Yes, it is he." 8. "Do you look for a donkey?" 9. "Yes, the place where it drinks is here." 10. "It may be better for us to go and look tomorrow." 11. They went (home) when the sun was inclining toward night. 12. They passed a graveyard. 13. When they came into an arroyo, they saw someone sitting down to bathe and a boy along with her. 14. When they made the donkey ascend (again from the arroyo), they said as they passed her, "Is the cotuprís bearing fruit yet?" 15. She did not answer them a word. 16. They said this as they went away to see if it was an Indian or a spirit. 17. When they made the donkey ascend upward, he fell with them. 18. As they were below the donkey, he did not rise with them. 19. They came out from under him (at last). 20. When they looked for her (the old woman), they did not see her anywhere. 21. As they got a fright, they left the donkey. 22. Taking away his cover (mat) and bringing it with them, they ran toward the house. 23. They told them when they came home (?), "Why, I wonder, did we see it?" 24. "Indians will die, that is why," (they answered).

TextII—The Lost Horses (The adventure of an Indian; AI)[2]

1. a'unəši səči·rua amah waima pienčiški" amak·a polo·sia mo·l(a) [*he-went* (**16.2**) *for-them* (**22.3, 7.2**) *horses many* (**2.3**) *forty* (**9.1**) *horses* (**7.6** (3), **7.8**) *ten* (**9.4**) *mules* (**2.3**)]. 2. a'unuši šči·rua amak·a [*he-went for* (**5.7**) *the-horses*]. 3. antəši· ši·rakuməī wəika [*he-came* (**16.2**) *to* (**22.3**) *water* (**7.6** (4))]. 4. e·ši wayu wašin·u [*there-were* (**20.1** (4)) *Indians* (**7.10**) *rich* (**8.3**)]. 5. "anči hiairua wale·muyu" [*have-come* (**16.2**) *you* (**10.1**) *friends* (**7.9**)] 6. "pe'ke·č šči·ru amah?" [(*you-*)*search* (**16.4** or **16.5**) *for horses*]. 7. "ya·siə ali·kala·" [*they-are-here* (**20.1** (1)) *at-night* (**21.3**)]. 8. "anatas a'unuli" [*might-be-good* (**10.2**) *going* (**7.19** (4))]. 9. nantaka'aka širakhe· wəika na' unaka'aka nučikwa· čampuyalu' [*when-they-went* (**24.2**) *a-second-time* (cf. čikwaya, **21.4**) *to-his-house* (**21.2, 3.12** (Note 18), **2.2, 7.12** (1), **23.1**)]. 10. nohots nuntəī anaī amak·a [*not he-came* (**19.1**) *by* (**22.2**) *the-horses*]. 11. "nohots tantaī anaī amak·a muhus·a maī taī sa·li ta'amaī nohoš te'kaī sa·li ta'amaī" [*not I-came* (**19.1**) *by the-horses* (*is-*)*sad* (**8.1** or **16.2**) *very* (**21.4**) *my-heart* (**7.12** (2 a)) *for my-horses* (**5.14, 7.12** (1)) *not can-eat* (**19.1**) *for my-horses*]. 12. "a'unəī hənəī pe'ke·ra wat· amə̄ī" [*let-people-go* (**14.1, 15.3** (5)) *to search* (**17.3**) *far* (**21.2**)]. 13. a'unaka'aka naī a'unəši naī piamaši numa nu·walakaih mo·la wane· ne'ehe·na wane· [*when-they-went* (**24.2**) *for-them* (?) *they-went* (**16.2**) *for-them* (?) *two* (**9.4**) *with-him* (**22.2** (2)) *his-brother* (**7.12** (4)) (*mounted on*)*a-mule one* (**9.1, 10.9** (1)) *mounted-on-a-horse the-other* (**10.9** (1))]. 14. nantaka'aka su·lu' wane wəī e·ka wane wayu· waši [*when-they-came to* (**23.2** (1)) *a-certain* (**9.3**) *water there-were* (**20.1** (4), **24.2**) *some* (**9.3**) *Indians* (**7.10**) *rich* (**8.3**)]. 15. "nase· wane wayu· waši. harali če· wayu·kono wašin·ukali·rua?" [*they-come* (cf. se·č, **16.5**) *some Indians rich who* (**10.5** (1)) *I-wonder* (**10.7**) *the Indians* (**5.6, 7.5**) *rich* (**7.6**)]. 16. nantaka'aka širuku wəika "anči hiairua

[2] Parts of the story are supplied by AO.

wale·muyu" [*when-they-came to the-water have-come you friends*]. 17. "halihe·ši hiairua?" [*whence-are* (**10.6** (4)) *you*]. 18. "hənaī pe'ke·ra čehe·ši Walawala wop·uhe·" [*to search(for lost animals) (we)are-from* (**20.1** (2)) *Walawala from-the-way* (**2.3, 23.1**)]. 19. "pe'ke·či (š)či·ru amah?" [*searching for horses*]. 20. "e·s amah pa·rutayu polo·s mo·la polo·s" [*there-are* (**20.1** (4)) *horses male* (**7.8** (1)) *they-are-ten* (**9.4**) *mules they-are-ten*]. 21. "ya·səī səmahatə ka'alatəī aip·a'a. nohots werahəī mak·a. a'unuši waya halas ni'piaya wane wayu· wašir" [*they-are-here* (**20.1** (1)) *with-their-animals people-passed* (**15.4**) *one-night not we-visited* (**19.1**) *the-place* (**7.6** (3)) *went* (**16.2**) *we* (**10.1**) *where-is* (**10.6** (4), **10.7** or **24.2**) *his-house* (**7.12** (3 a)) *a-certain Indian rich* (**8.3**)]. 22. "haraih wayu· wašič·ia?" [*who(was)* (**10.5**) *the-Indian rich that-one* (**10.3** or **10.7**)]. 23. "uč·aī ni'pia ča·ya Ki·ho·l" [*over-there* (**21.2**) *his-house at* (**22.4**) *Kihol*]. 24. na'unaka'aka aip·a'a nantaka'aka čaməī Ki·ho·l širakuməī wane wəī [*when-they-went* (**24.2**) *they-came* (**24.2**) *to* (**22.4**) *Kihol to a-certain water*]. 25. tuwəika e·ka' aka wayu· hima'ali na'pula širaku wəika [*at-the-water* (**20.1**; tuwəika for tə wəika, cf. tuwane, **10.9** (1)) *there-were Indians young* (**7.19** (4)) *opposite-them* (**22.2** (4)) *near* (**22.3**) *the-water*]. 26. "anči hia wale·muyu" [*have-come you friends*]. 27. "halihe·ši hiairua?" [*whence-are you*]. 28. "čehe·ši wane mah Walawala. halas ni'pia wane wayu· wašir Sororori?" [*(we)are-from a-certain place Walawala where-is his-house a-certain Indian rich Sororori*]. 29. "uča· ni'pia" [*over-there* (**21.2**) (*is*) *his-house*]. 30. "kasa pia nunaī?" [*what* (**10.5** (2)) (*are*) *you to-him(by way of relationship*; **22.2** (3))]. 31. "nə·ləī waya" [*his-grandsons* (**7.12** (2 b)) *we* (**10.1**)]. 32. čaīhana waya atūkəī e·məī [*will(go)-there* (**16.6, 20.1** (2)) *we to-sleep* (**14.1, 15.4**) *to-where-he-is* (**21.2**)]. 33. "hauya humaiwa waya" [*let-us-go* (**13.3,** 25) *with-you* (**22.2** (2)) *we*]. 34. nantaka'aka numa'anaməī wayu· lakla [*they-came to-his-own* (**20.3**) *an-Indian old* (**8.4**)]. 35. "anči hia wa'irumuyu" [*have-come* (**16.2**) *you* (**10.1**) *friends* (**7.9**)]. 36. "yaihana (yaīhana?) waya atumpunəī ma'ana" [*(here)come* (**16.6** (?), **20.1** (1)) *we to-sleep-on-the-way* (**18.5, 15.4**) *(at)your-own* (**20.1, 20.3**)]. 37. hašak·aha·si su·puna lumak·a [*they-went-down* (**16.2** (?)) *under* (**22.2** (6)) *an-arbor* (lumah; **7.6** (3))]. 38. "hi'ikaha səi na'pula wayu·kan. haukta saī wane an·e·r" [*bring* (**13.1**) *a-hammock for-them* (**22.2** (4)) *the-Indians* (**7.5**) *kill its-life* (**4.1, 13.1** (6), **7.12** (2 a)) *a* (**9.3**) *sheep*]. 39. auktaka'aka an·etka ne'kəī [*they-killed* (**24.2**) *the-sheep* (**7.6** (4)) *that-they-eat* (**14.1**)]. 40. "hauhe·r hu·u·aka?" numaka'aka wayu·kaih lakla·kaih [*what-time* (**21.3**) *you-go* (**19.4**) *he-said* (**15.5**) *the-Indian old* (**8.4**)]. 41. "a'une·n waya wat·a·" [*shall-go* (**16.5**) *we* (**10.1**) *to-morrow* (**21.3**)]. 42. "haīha nemia. a'-is hamu su·lu' wop·uh" [*make* (**13.1** (2)) *their-provisions* (Spanish fiambre; **7.12** (3 a)) *it-feels-bad* (**8.1**) *hunger on* (**23.2**) *the-way*]. 43. na' unaka'aka wat·ačō "pa'apa wa'anapahəī mo·la piamas. anataš nu'unəī wane hintəih mo·la suma· maiku (maik·i) šimiahatə mo·laka [*when-they-went* (**24.2**) *in-the-early-morning* (**21.3**) (*they-said*) *bring(us)* (**13.3**) *that-we-borrow* (**14.1**) *mules* (**7.10**) *two* (**9.4**) *he-will-be-good* (**10.2**) *that-he-go* (**14.1**) *a boy* (*on*) *a-mule with-it* (**22.2** (2)) *maize* (**5.14,** Note 37) *its-provender* (**7.12** (3 a)) *the-mule* (**7.6** 2))].

Free translation. 1. A man went to search for many horses, forty horses (and) ten mules. 2. He went for the horses. 3. He came to a water. 4. There were well-to-do Indians there. 5. "You have come, friends," (he said). 6. "(Are you) looking for horses?" 7. "They are (usually?) here at night." 8. "It is better for people to go (and search)." 9. They returned from the water and went back again to the man's house. 10. They had not found the horses. 11. "I have not found the horses, my heart is very sad for my horses, I cannot eat for my horses," (he said). 12. "Let people go and search far," (he said). 13. When they went for them, they went two, he and his brother, one riding on a mule, the other on horseback. 14. When they came to a certain

water, there were some well-to-do Indians there. 15. "There are some rich Indians coming: I wonder who the rich Indians are," (they said). 16. When they came to the water, (they said), "You have come, friends." 17. "Whence are you?" 18. "To search for lost animals. We are from the direction of Walawala." 19. "(You) search for horses?" 20. "There are ten male horses and ten mules." 21. "There were people passing here with their animals the other night. We did not visit the place. We went to where the house of a rich Indian is." 22. "Who is that rich Indian?" 23. "Over there is his house, at Kihol." 24. They went and came to Kihol, to a certain water. 25. At the water there were young Indians in front of them (near the water). 26. "You have come, friends," (they said). 27. "Whence are you?" (the young men asked). 28. "We are from a certain place, Walawala. Where is the house of a certain rich Indian (whose name is) Sororori?" 29. "Over there is his house." 30. "In what relationship are you to him?" 31. "We are his grandsons." 32. "We will go and sleep at his place." 33. "Let us go with you." 34. They came to the place of an old Indian. 35. "You have come, friends," (the old Indian said). 36. "Here we are coming to pass the night at your place." 37. They dismounted (and went) into an arbor. 38. "Bring a hammock for the Indians. Kill a sheep," (the old Indian said). 39. They killed the sheep for them to eat. 40. "When are you leaving?" the old Indian said. 41. "We shall go tomorrow." 42. "Make provisions for them. One gets hungry on the way." 43. When they went early in the morning, (they said) "Let us borrow two mules. It may be better if a boy goes on a mule with corn to feed the mule." (The story, which was a very long one, was not finished.)

Reviews

TONE LANGUAGES. A TECHNIQUE FOR DETERMINING THE NUMBER AND TYPE OF PITCH CONTRASTS IN A LANGUAGE, WITH STUDIES IN TONEMIC SUBSTITUTION AND FUSION. By Kenneth L. Pike. Ann Arbor, University of Michigan Press 1948. University of Michigan Publications, Linguistics Vol. IV. xii + 187 pp. $2.25; $3.00 cloth.

Pike's treatment of tone languages is the first analysis both extensive and systematic that applies the principles of structural analysis based on the concept of the phoneme. Designed, as are his other recent volumes, both for the investigator and for the student in training, it fills a bad gap. As a first compilation of thought and application, it is a basic book of reference. Pike gives much that is interesting and original, and one of his strong sides in this respect is pedagogical application. No need to say, this opus is to be seriously appreciated, as it is by the reviewer. If, then, in the following the stimulation it provided appears, because of basic considerations of method, to have produced criticism more often than praise, both are nevertheless offered by a fellow-sufferer of Pike's in struggles with tone problems, a fellow-sufferer who didn't stick his neck out, whereas Pike took a big breath and did.

The book does not pretend to be a critical analysis of the field as such, nor a summary of the tone languages sofar studied. Actually, however, it is in some respects both. Its essential aims are *a*) to demonstrate that tone phenomena in language are as amenable to phonemic analysis as are speech sounds; *b*) to call attention to the special difficulties (of conceptualization and practical resolution) when dealing with tone, and *c*) to suggest ways and means to overcome these. Accordingly, in clearcut organization for which Pike has a flair, Part I describes characteristics of tone languages *as defined by Pike* and contains theory and methodology; Part II offers a set of suggestions for actual procedure in working with tone languages; Part III brings first-hand detailed material from Mixteco and Mazateco which Pike studied intensively, with the assistance of students and of his sister Eunice Pike.

The basic content of theory and method is laid out so well that it will be serviceable to give certain statements and definitions in some detail below, with quotes where the exact intent of the author may be obscured by rephrasing. This will also be more fair in tracing Pike's preferences and biases than my unsupported statements would. The items are numbered for cross reference:

1) "The principles of phonemic analysis now in general use in the analysis of segmental phonemes are equally applicable, in theory, to the study of tonal phonemes. Various special practical problems arise, however, when an investigator attempts to apply these principles to pitch data. In order to solve such problems it is advisable to modify the phonemic procedure, and to amplify phonemic theory, with reference to tone." (p. vi)

2) In dealing with tonal phenomena, a basic practical difficulty arises since tone, whether a level tone or a glide, is always relative, or variable, when it comes to its position within the pitch continuity; thus it lacks the "typical sound quality" of a phoneme (i.e. a let's say non-prosodic phoneme) "which remains somewhat constant even within the range" between positional variants, e.g. fronted and retroflex *s*. (p. vi)

3) A further problem is to distinguish non-significant fluctuations of tone from phonemic changes, and from other, structurally significant shifts. (p. vi)

4) The pitch or tone element which can be interpreted tonemically may show up in a language in two essentially different ways: *a*) Spread over a word or an entire phrase; where this is a case we have *"intonational*

languages." These are not discussed in the present treatise (p. 5). *b*) Associated as tonemes with syllabic units, one each: "A tone language may be defined as a language having lexically significant, contrastive, but relative pitch on each syllable." (p. 3) "Most frequently there is a one-to-one correlation between the number of syllables and the number of tonemes in any specific utterance." (p. 4)

5) Toneme systems are of two essentially different kinds. In some languages the system is based entirely or largely on level-pitch register tones (*"level-pitch register systems"*); in others, entirely or largely on gliding-type tones (*"gliding-pitch contour systems"*). In the latter the glide is one tonemic unit; in the former glides may occur but are to be interpreted as secondary results of movement from one register tone to another, e.g. where identical vowels adjoin each other. Such an apparent glide may be "interrupted by a morpheme boundary" or it does not need to be (p. 5).

6) "It is convenient to consider that the tonemes are basic to or inherent in the lexical form of the words and their syllables." This inherent toneme of a word may be replaced by another, however, in various grammatical contexts (p. 5).

7) Register-tone languages and contour-tone languages may be "pure," or there may be "overlaps" between the two types. For instance: "If, however, glides develop which, though composed of juxtaposed level tonemes, have some characteristic of timing or placement of the separate level tonemes, a contour overlap may be postulated for classification. A contour overlap may also be implied if there is not a one-to-one correlation between tonemes and vowels." (p. 12; compare for this last the end of 4).)

8) Related to end of 7): "Although tonemes are usually placed on the vowel of the syllable, they sometimes occur on syllabic consonants, or a glide may end on a voiced consonant in the same syllable." (p. 7)

9) The more contrastive registers a language has, the less far apart they are apt to be in actual tone or interval distance (p. 6).

10) Phrase or sentence intonations or melodies "do not change the basic register-tone or contour-tone system of the language," although they may in various ways impinge on it (p. 17).

11) Various languages using pitch that affects meaning are nonetheless not included under the definition of tone-languages, for example: *a*) "word-pitch systems": pitch is used for differentiating meanings of lexical items, but it is limited to certain syllables or to certain positions within the word (Swedish, Norwegian). *b*) "Phrase-pitch" or "intonational systems"; e.g. English (p. 15).

12) While tonemes have no meaning, phrase-intonations do, at least "shades of meaning." Tonemes are "intrinsic parts of the lexical items, whereas the intonations are extrinsic, adventitious parts of utterances." (p. 15; see above, 11).)

13) Speakers of English do not find it difficult to hear tonemes because of lack of training in handling pitch, but because English has an intonation system. Musical training does not seem to help particularly (p. 18).

These statements represent a good sampling of the theoretical part of the book and contain the basic propositions, with some minor points thrown in at the end; item by item commentary follows:

1) No specific demonstration is offered as to how amplification of phonemic theory is called for in order to deal with tone satisfactorily. Pike's gift for pedagogy and his zeal for or preoccupation with methodology at times cause a lack of distinction between new concepts that would call for redefinitions, and new practical procedures for novel material. To the contrary, it would seem that some weak points in his treatise are due to not transferring conveniently available and established phonemic theory to tone, perhaps because tone appears to Pike to be

so essentially different from other sound phenomena. For this, see e.g. comment 8).

2) Calls for re-phrasing: It is hardly a "typical sound quality" of a toneme that remains "somewhat constant." Constancy of sound may be present in naive intuitive experience, especially of the outsider; actually some constant element is required for the typical set of contrasts by virtue of which the toneme becomes distinctive. The phonetic similarity "even" of allophones becomes embarrassing as soon as they show up in another language as distinctive and independent phonemes.

On the other hand, there appear to be definite limits to how relative the position of tones may be. In my experience, of (3-tone register and 4-tone register) West African languages, a given speaker will very rarely, even under great emotional stress, place a low tone as high as the norm of his high tones, and vice versa. Again, in my experience, if a speaker in these languages was asked to utter a sequence of brief disconnected words, with brief pauses in between, the sequence being formed by an ascending or descending set of tones, the tone distances remained fairly undisturbed. Groups of isolated words with the same tone and uttered with slight pauses in between maintained the level fairly well. Kymograph and acoustic recordings of such and similar material taken from Jabo as well as wire recordings from Yoruba support my statements. In some languages, or at least with some speakers, isolated words spoken in repose are apt to be fairly well identifiable as to register, especially the "high" and "low." Thus, while in conversational material admittedly there is much more shifting about, the "relative" quality of pitch, once it is understood or clearly conveyed, need not be exaggerated.

The main practical difficulty with tone appears to be, rather, that the actualizations of the contrasts—given by successive distances between tone levels or by successive tone movements—do shift all the time. The same speaker will never substitute in his normal speech an *u-o* contrast for an *o-a* contrast as a free variant, and expect that his vowels will be taken for *o-a*, assuming the four vowels are phonemes in his language; or similarly a *p-t* for a *t-k* contrast. With tone phenomena what appears to be such a substitution *can* occur; the *positions of the tone actualizations need be much less fixed* throughout the stream of utterances; the coordinates from which one might plot the positions must be shoved around all the time. This operation—the extensive shifting of the position of the figure in space without impairing its function—does not work with the other phonemes. But the operation, it might be recalled here, is one of the classic earmarks of what the German configurationist psychologists termed a *Gestalt* or configuration; a triangle or a rose, to take simple examples, remain triangle and rose, whether they are placed higher or lower, whether to left or right, on a wall. They remain also the same when enlarged or reduced in size, just like the interval between two tonemes, or the extent and place of a glide-toneme.[1] This concept appears to have its usefulness—Sapir found it very stimulating for his paper on Sound Patterns—and it is perhaps too bad that behaviorism is practically the only brand of psychology which was permitted to help mapping out the precincts of our Bloomfieldian structural linguistics.

To return to the tonal phonemes, however, objective identifiability of the isolated

[1] I had the good luck to observe a dramatically extreme case of the force of configuration in West Africa: in a 3-tone system of signal-drumming, high-tone and low-tone were turned about completely, with the middle-tone intact between. This did not impair intelligibility appreciably; native comment to my questioning was, "well, it is an old drum; it doesn't sound as well as a new one." The matter was due solely to unwillingness, extending for years, to go through the trouble of manufacturing and consecrating a new drum to replace this only, faulty signal-drum the community had. The neighboring community, incidentally, also got used to listening to the drum without undue irritation. (See Drum Signaling in a West African Tribe, Word 1.232-233 (1945).)

unit becomes not only difficult; it is actually a meaningless step unless it is part of a statistical study of the area of distribution or the like. Yet, the tonal phonemes nevertheless act as sets of contrasts. They are perhaps, together with stress and length, phonemes *par excellence* rather than an unorthodox sub-group of phonemes, as Pike sees them.

3) This is the classic statement concerning the mechanics and dynamics of sound in language, as the structural analysis perceives them.

4) Gives a useful practical distinction *pro tem*, although it leans on the weak reed of the syllable concept. Even so, in a rich tone language one can only too easily find himself in a circular trap; by the time the more than a few months have been spent on the language which are required in order to have an opportunity to observe and analyze all tonal complexities, the linguist can be easily pushed to trying on the one hand to define the "syllable" as *the* toneme-carrying unit, yet again to define the toneme as that which sits on the "syllable." Time and again this dead end loomed in Sapir's and my work on Jabo of Liberia, despite Sapir's effective substitution of a "mora" concept for "syllable."[2]

Further awkwardness arises because a number of languages which Pike would hesitate to call intonational languages are best interpreted as having at least some tonemes that are associated with longer units than one "syllable." Worse yet, the same tonemes may be spread over either monosyllabic or longer units. Suggestive terms like Pike's "overlap" can't help here, since it is in the nature of the respective tonemes that they may be found with units ranging from one to *n* number of "syllables"; accordingly they show allophonic variations which in Pike's terms are "glides" for the allophones on the monosyllable, but sequences of "lexically significant, contrastive pitch on each syllable" for the polysyllable. This has a bearing also on points in 5) and 7), above. Pike admits the possibility that languages may exist in which tonemes are consistently spread over "words" instead of being bound to syllabic units (p. 5), but they are ruled out from his treatment of "tone languages."

Apart from the awkwardness of insisting on the "syllable" or "vowel" as the toneme-carrying unit—in many cases, of course, such assignment or localization of tonemes does not happen to cause trouble—,the concrete features just referred to are almost impossible to explain away. It will suffice to look at some examples from Beach's excellent and very careful study of Hottentot.[3] They are selected from the Nama dialect which is best known and on which Beach worked most intensively.

Nama has seven basic tonemes for the so-called "strong roots,"—that is, elements which function as stems; the tonal situation with regard to affixes has not been worked out fully as yet. Of the seven tonemes, six are actualized as glides, the seventh however usually as a level tone. In the following three columns three of the phonemes are given from more elaborate lists in Beach. (The first two rise to "high" and to "mid," respectively; the third is placed between "low" and "mid" register. Beach's orthography and tone-marks have been retained.)

High-rising toneme		Mid-rising toneme		Low-mid level toneme	
ˈsā	*to rest*	ˌtā	*rejoice*	–tI	*ask*
ˈʔōā	*to calve*	ˌpai	*to push*	–ʔai	*on*
ˈkurip	*year*	ˌpaip	*ram*	–xaip	*koedoe*
ˈnana	*to be still (of weather)*	ˌʔarip	*dog*	–sari	*visit*

The sample indicates that whether the morpheme is of a CV, CVC, CVV, CVVC, CVCV, or CVCVC type, it has the same toneme.[4] This means that the rise is actual-

[2] For "mora" see Sapir's Notes on the Gweabo Language of Liberia, Lg. 7.30–41 (1931) and my Drum Signaling in a West African Tribe, loc. cit.

[3] Douglas M. Beach, The Phonetics of the Hottentot Language, Cambridge 1938, pp. 132–142.

[4] No CVC example is given here, in order to

ized, at least for CVCV and CVCVC, as two separate "syllabic" tones; similarly the level tone is simply repeated for these types.

Beach's kymograph recordings which are included in his study show that there is no chance that the monosyllabic units above are perhaps long syllables—in which case they could be interpreted as vowel clusters, and the glides as secondary. Long monosyllabic words occur too; they are distinct from the short, and carry the same tonemes. Beach's contention that Hottentot is a language in which not the "syllable" but the "root" is the tone-carrying unit, which he makes the basic proposition of his elaborate study, is certainly supported by the material. The merits or demerits of the "root" concept do not change the situation. The description, incidentally, jibes well with all the earlier published material on Hottentot, which is fairly voluminous and already contains discussions of tone. The phonetically written parallel forms from the classic Hottentot dictionary of Kroenlein which Beach submits, support his thesis also. Pike describes the matter in curiously dubious terms; had he looked at the kymograph notations or the phonetic length markings of the pre-Beach material which Beach displays in full, he would hardly sum things up by saying, "Beach's description is not convincing, but may be the correct one." (P. 11, fn. 22.) No reasons are given for his skepticism. This is making somewhat short shrift with one of the most careful analyses in the literature on tone. Material comparable to the Hottentot can be located in various "Sudanese" languages; in a number of Bantu languages the distinction between Pike's "tone-languages" and "intonational languages" is still less feasible to carry out.

5) The statement on glides suggests to the reader a parallel with phonemic length versus a cluster of identical phonemes; such non-phonemic glides occur, however, only with clusters of identical vowels and the like; not between "any two juxtaposed tonemes." (p. 6, see the Mixteco examples; this may be merely a matter of bad wording.)

6) see 10).

7) The paragraph as quoted indicates some reluctance to admit "overlap" between "register-tone" and "contour-tone" languages. "Timing or placement" are not clear; "timing" seems to refer to length as a syllabic property; "placement" to positional matters. Admitting "contour-overlap" where there is no one-to-one correlation between tonemes and vowels leaves some contingencies untouched. E.g., tone-carrying "syllabic consonants," unless they may be considered vowels (perhaps merely an omission here), or difficulties with quick-gliding tones on normal-short vowels. The latter can be at times interpreted also as "tonal diphthongs," parallel to true vowel-diphthongs as against regular vowel-clusters. These quick-glide tones are especially pesky; if a mora-unit is acceptable, they posit either the necessity of speaking of half-moras, or of considering diphthongs phonemic, which then forces positing diphthongs of identical vowels. See further below.

These points may be followed up in Pike's own Mazateco material. Glide tones which are very common here, are interpreted by Pike as representing "slight overlap of contour-type characteristics." Most of the nouns have a final glidetone; "two tonemes on a single short vowel" (p. 12). This would be a case of a toneme being carried by a unit shorter than a syllable, or even a vowel. On p. 96 we have the statement, however, that nonpersonal nouns (which form a very great majority of the nouns) have four level-pitch tonemes. (Numbered from 1 to 4, from high to low; in quick glides a hyphen intervenes between two numbers.) These are referred to as "lexical tonemes," although they occur only in certain contexts, such as when followed by an adjective. Otherwise, and in isolated utterance too, nouns have glide-

avoid the difficult symbols for clicks which happen to be frequent in Beach's examples for CVC. Morphemes with initial consonant clusters fit in with the rest.

tones of various types: "Pronounced by themselves they receive a syntactic down glide on the vowel" (p. 96). These glides are conceived to result merely "as the connection between the significant level tonemes, whereas in the contour type the glides are basic to the system" (p. 12). Again, "the basic tonemes of Mazateco are level" (p. 93).

Why the tone of the noun in isolation should be considered secondary, and its tone in the noun-adjective phrase "basic" (p. 96), is not clear. Interestingly, when noun-adjective phrases coalesce to the point where they may be considered compounds, the adjectives take on the glides typical of nouns. (However, the word-pair n$^{?}$ai$^{4\text{-}3}$hča$^{1\text{-}}$ *grandfather* and na^{4}hča$^{1\text{-}}$ *grandmother* (on p. 97) shows that quick glides can occur also either with what one would consider, following morphemic analysis, a noun followed by some qualifier, or within what Pike's writing indicates to be meant as a word-unit "noun.") One could well posit tonemes with two positional variants or allophones: level and glide; but which is "basic" might be hard to say if not meaningless.

The difficulty of interpreting the tones of Mazateco diphthongs and triphthongs is related. They are said to have "a single toneme on a rapidly pronounced cluster of two or even three vowels" (p. 12). But if n$^{?}$ai$^{4\text{-}3}$hča$^{1\text{-}}$ *grandfather* has a diphthong *ai*, then its tone 4-3 is a *single* toneme, according to Pike's logic. That Mazateco diphthongs are phonemic is stated explicitly elsewhere.[5]

8) There appears uncertainty here, whether *hearing* the toneme "on" the vowel is meant, or whether the vowel rather than some larger unit is assumed to be the carrier of the toneme. In either case, the attempt to always pin the toneme down to a delimited unit such as vowel cannot be successful. For some reason, while Pike admits that a post-vocalic (final) consonant may carry part of a glide, he is hesitant to grant this privilege to a prevocalic (initial) consonant. Thus there is disregarding or misunderstanding of a number of features in languages cited by him, for example of Sapir's "anacrusis" tones in Jabo. With these, and with the so-called "emphatic" consonants, tone production (which Pike appears to be interested in) begins with a prevocalic consonant. Sapir left the question open whether the toneme itself pertains to the vowel or to the whole mora. These consonants do, however, have a bearing on the phonemic system, contrary to Pike.[6]

It is surprising that for these questions, in which confusion between observation by the ear and conceptual segmentation seems to be involved, Pike did not gain more clarity from entirely similar principles that hold for stress.

9) This generalization is not borne out by my experience and recordings. In a 2-tone register language, such as Navaho, the contrastive levels are often exceedingly close to each other. Yoruba has its 3 tones on the whole closer together than Jabo its four. This would fall in line with other patterns of phoneme positions; only extended objective recordings and measurements can give a sound basis for generalizations, however.

10) Pike makes an important suggestion here, disregard or lack of clear grasp of which has caused much obscurity and confusion in presentations by students influenced by Daniel Jones, e.g. Doke on Zulu, and others.

11) Exclusion of "word-pitch" systems, just because pitch operates in these languages on a more restricted level, may not prove to be well-advised. When more tone-languages are known, it will probably turn out that there is a gradual transition from full-fledged "tone-languages" to cases like Pima in Arizona, apparently also Maya, where tone functions only in a very limited

[5] Pike, Kenneth L. and Eunice Victoria, Immediate Constituents of Mazateco, IJAL 13.78–91 (1947).

[6] For Pike's discussion of Sapir's description, see p. 30, fn. 31. His phrase, "Sapir claims that . . . begin on a lower pitch . . . " is baffling, in view of Sapir's notoriously virtuoso ear, and over two years' experience in listening to the language.

fashion as a contrastive feature. Off-hand it would seem that there is more variety in the structuring of tone-phenomena in language than in the structuring of stress-phenomena, whatever the reason may be, so that such a graded series of transition is more apt to emerge in the future for pitch or tone than for stress.

12) In what sense can tonemes be more "intrinsic" to lexical items than intonation to utterances? If the intonations have meaning, or at least "shades of meaning" (p. 15), they cannot be adventitious. Aren't choices between different intonations parallel to choices between different tonemes, whether for grammatical or other distinctive purposes?

13) On this minor practical point which is not, however, without interest, I believe another interpretation is also feasible. I have observed cases, including my own, where musical training (that is, thorough musical training) helped considerably for hearing tone; and many others who were considered "tone-deaf" by musicians and who had trouble with linguistic tone. In my teaching experience, however, as soon as a beginner was willing to believe that he could hum or sing the speech tones of a word or phrase, he could soon also identify them. In other cases, beginners heard tone as soon as they began to listen for stress; this was bound to work since in most tone-languages phonemic stress is absent, whereas in languages like English (high) tone is very frequently a secondary concomitant of stress. Thus in a 2-tone register language high tone was easily experienced and designated by beginners as stressed, and low as unstressed; only the conceptual and verbal change-over was then necessary. This suggests that confusion between insecure identification of pitch with stress is at least one factor in difficulties in hearing or identifying tone. Conversely, I observed that West African beginners in English make an attempt to reproduce English stress—but not English intonation—in terms of pitch (similarly, in English and other European or Arabic loan-words into West African languages stress is reinterpreted as tone).

Pike's terminology is often fortunate and fresh, though at times it includes new terms without compelling necessity, it would seem: "arbitrary tone sandhi" for "morphophonemic alternations" (p. 26 etc.); "tonemic perturbations" for various phenomena which are essentially indicative of rules governing the sequence or clustering of phonemes. "Change of Key" or "octave" is rather ill-chosen for designating a certain variability in the higher or lower placement of the voice, including naturally the placement of the tonemes; variability which may be ascribed to emotional and similar vague factors. Once one grants the constant variability and shifting of the voice in the up and down of speech melody, in all languages of the world, a special category of "changes" of this type, as established by Pike (p. 27), cannot exist.

"Key" and "octave," on the contrary, are defined in music by virtue of *fixed* positions, fixed tones and intervals, and so on, all of which the tonal phenomena of speech do not possess. This category embroils Pike in a few misunderstandings. He believes a situation related to these "emotional" fluctuations of voice level is being meant by D. F. Bleek when she reports that in Bushman "tones are also used descriptively to denote quantity or distance. The larger or farther a thing is, the higher the tone of the adjective or adverb describing it."[7] While Bleek's German original is not available to me at present, neither Bleek nor Tucker, whom Pike adduces at this point for Sudanese, are considered or consider themselves adepts at tone analysis. Bleek's statement refers to an almost universal feature in Sudanese, common also in Bushman and Hottentot (and Haitian Creole): the use of toneme contrasts for expressing, among other things, diminutive against normal size or augmentative. Mor-

[7] D. F. Bleek, Bushman Grammar, Zeitschrift fuer Eingeborenen-Sprachen 19.85–86 (1928).

phemes that submit to this alternation *can* intensify their meaning by heightening their high or lowering their low phonemes, perhaps more so than some other types of words. But the "emotional" or dramatic factor is present only in the greater variability in the actualization of the contrasting phonemes; not in the phoneme contrast itself. The sound symbolism aspect belongs in a different category. It is interesting to observe, however, that in a number of African languages the association is in the reverse; high tone is associated with small size or distance when in contrast with low tone for large size.

Another case, perhaps of misreading, refers to my reporting that in Jabo signaling parts of signals or short signals can be transposed at will by the player; the player commenting, "you can play them in low or in high." When this happens, naturally the agreement of speech tonemes with musical pitches on the instruments is violated.[8]

Further interpretation calls for applying linguistic concepts to musical matter, which for present purposes may be permissible. From the strictly linguistic view, the phenomenon appears like free variation for esthetic purposes. From the musical point of view, however, after equating musical tones with speech tonemes or with phonemes —which is what happens in most African signaling—transposition means replacing one set of phoneme-like units by another, which naturally affects vitally the status of the tonemes of the text which is being signaled. The "musical allophones" or representatives of the tonemes of the signal-text are shifted in free variation to musical allophones of other tonemes, although the relation between the tonemes of the signal is preserved. I stated in my description that there was no parallel in speech to this type of phenomenon, meaning in Jabo speech; one might add that there seems to be no parallel to it in any speech, prose or poetry. (A simple code would be feasible, in which, say, an *i-e* contrast would be replaced by an *e-a* contrast, when the four vowels are phonemic.) However, Pike interprets the case as belonging to his category of "emotional changes of key"; and naturally he must then assume that I am "unacquainted with this tone-language characteristic," namely free fluctuations in voice level, or in placement of tonemes.

Possibly at times the exact statements of others were not before Pike when he referred to them, and they became simplified or shifted in recollection. I notice his quoting me (p. 34 fn. 42): "In Navaho the chants are usually closely related to the speech tones, according to G. Herzog." My essay to which he refers states, however, that either speech tones and melodic line mutually adjust to each other, with violations of both forces frequent, or that, in the great bulk of the material, the melodic lines of the chants are *not* related to the speech tones and very frequently clash with them.[9]

This perhaps too painstaking scrutiny of Pike's theoretical foundation for the more applied or more specific contents of his volume seemed necessary because of the interest which the phenomenon of speech melody holds in language, and because structural analysis has not been extensively applied to this phenomenon as yet, although of descriptive data there is a very considerable amount, much of which will be exceedingly useful once it is reorganized, or even reworded. The critical commentary of this review cannot be balanced, for reasons of space, with an appraisal of the solid contents of Pike's other sections. There, the points to which exception was taken often enough do not create trouble where they might be expected to. The Mixteco material on tonomechanics is a valuable addition to what we know of similar developments.

[8] See my Speech-Melody and Primitive Music, The Musical Quarterly 20.456 (1934), and also Drum Signaling in a West African Tribe, loc. cit.

[9] See Speech-Melody and Primitive Music, loc. cit.

It may be due to the scattered nature of the literature on tone and its analysis, and because Pike, perhaps against his own original intentions, did proceed to write a systematic treatment, that the structure needs shoring up a good deal. Many basic classifications and distinctions are thus based on the analysis of too few languages, or on material not sufficiently re-analyzed; they are premature. Practicable working distinctions become rigid categories; Pike is perhaps too prone to categorize and to delimit fields arbitrarily. Divergent material is not treated with sufficient care, or considerable care is spent with casting doubt on solid information; yet Pike's final comment may be that if the matter should turn out differently, the outcome would call for only a minor shift in his categories. Pike's citations, especially of non-English or non-American studies, tend to be too selective; and data of first rate importance may be left out of consideration. Even detailed and systematic, workmanlike treatments of the field of tone, like Beach's,[10] are barely mentioned, perhaps because the phraseology is not the modern one.

Pike equates theory with methodology, and in turn methodology, the fetish of modern science, with practical commonsense procedure or application:[11] new methodology ought to follow from new theoretical premises. Thus the intuitions, insights, and brilliant ideas of men like Sapir, Trubetzkoy, and Jakobson, and the contributions which they achieved when mapping out, often in a few pages, much ground, are essentially slighted.

Yet, it should be said that the book is bound to serve as a very helpful tool to those linguists who had so far little occasion to handle tone problems in their first-hand experience; it stimulates thinking and clarifies thought whether one is in agreement or not; it is a must reading for anyone interested in phonemic analysis. This reviewer is among those who would sincerely hope that Pike will find time and occasion to devote himself to working on phonemic theory free from any involvement with pedagogical preoccupation, and that a revision of his Tone Languages will be one of the fruits of such an occasion.

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DETAILED ATLAS OF THE HEAD AND NECK: By Raymond C. Truex and Carl E. Kellner. Oxford University Press, New York, 1948. xiii + 162 pp.

0. The Truex and Kellner atlas is worth the attention of the articulatory phonetician in that it presents a comprehensive physiological matrix for the extraction and functional labelling of articulators. Articulators (e.g. tongue, oral cavity, pharynx, larynx), which are usually treated pragmatically by phoneticians, with gross anatomical features correlated generally with gross speech-sound function, are here illustrated in careful detail. The entire phonetically relevant mechanism is not represented in the atlas, since tracheal and esophageal extensions (to and including lungs and stomach) are not thoroughly illustrated. (From the point of view of total action and reaction during a single human speech act reference would ultimately need to be made to the entire organism.[1]) But the anatomical geography most immediately essential for the articulatory phonetician is given here. Truex and Kellner provides an anatomical amplification of the simplified head charts which appear in standard phonetics handbooks.

1.1 The atlas (planning and dissections by Truex, paintings and drawings by Kell-

[10] Beach, Douglas M., The Science of Tonetics and its Application to Bantu Languages, Bantu Studies, 2d series, 2.75–106 (1924).

[11] Inserting words into selected contexts to observe pitch, for instance, seems to Pike a matter of methodology (see p. vii); Sapir in his classic Gweabo (Jabo) article took it for granted; apart from pitch it is hardly a new device.

[1] Cf. N. Wiener, Cybernetics, New York, 1948, pp. 28 ff., where a feed-back system frame of reference is applied to muscular clonus. Speech events may also be stated as feed-back reflexes.

ner) is designed for the use of surgeons and anatomists, in schools and in practice. It includes the following: Regional Anatomy: Posterior neck and back (4), Spinal nerve and cutaneous areas (2), Lateral neck and axilla (5), Anterior neck and thorax (5), Lateral face, pharynx, and oral cavity (9), Cranial cavity and contents (5), Brain, Circulation (7), Brain, Topography and dissection (10, Cerebellum (4), Labyrinth, Cavernous sinus and orbit (4), Eye and orbital contents (9), Pharynx and esophagus (3), Larynx and trachea (7), Nasal cavity and paranasal sinuses (7), Palatine tonsil and floor of oral cavity (2); Skeletal Structures: Cervical vertebrae (5), Skull (8), Ear bones (4), Median section, Skull (2), Hyoid bone (1), Atlanto-axial joint (1), Paranasal sinuses (1); Frontal Sections (12); Transverse Sections (20). Index pp. 137–162. Especially relevant for the phonetician are: Fig. 13. Thyroid gland and vessels of the anterior neck (2nd layer); Fig. 15. Nerves and viscera of the neck and superior mediastinum; Fig. 24. Pterygopalatine region and floor of the mouth (8th layer); Fig. 23. Lateral pharyngeal space and floor of the mouth (7th layer); Fig. 65. The pharynx. Posterior view; Fig. 66. Interior of the pharynx. Posterior view; Fig. 67. Pharynx, larynx, and trachea. Lateral view; Fig. 68. Muscles, vessels, and nerves of the larynx. Posterior view; Fig. 69. The laryngeal cavity. Superior and posterior view; Fig. 70. Cartilages and ligaments of the larynx. Posterior view; Fig. 71. Cartilages and ligaments of the larynx. Right lateral view; Fig. 72. Muscles and nerves of the larynx. Right lateral view; Fig. 73. The interior of the larynx (1st layer); Fig. 74. Cartilages, ligaments, and membranes of the larynx (2nd layer); Fig. 75. Median sagittal section of the head and neck; Fig. 76. Nasal septum; Fig. 77. Lateral wall of right nasal fossa (1st layer); Fig. 78. Nerve supply of the lateral wall of the nose. Medial view (2nd layer); Fig. 79. Arterial supply of the lateral wall of the nose, and nasopharyngeal muscles (3rd layer); Fig. 80. Palatal structures and ostia of the paranasal sinuses (4th layer); Fig. 81. Paranasal sinuses, pterygopalatine structures, and floor of the mouth (5th layer); Fig. 82a. Lateral pharyngeal space and floor of the mouth (6th layer).

2.1 For articulatory phonetics Truex and Kellner provides a graphic index of articulators. An index of articulator function may be sought elsewhere.[2] From this latter index a sub-index of speech-sound articulator function may be isolated in order to provide working definitions of the speech-sound units which phoneticians use or will use as the basic corpora for their operations.[3] For acoustical phonetics similar indices are in process of development.[4] The two fields (articulatory and acoustical phonetics) are related insofar as the correlation of articulator function with human hearing is taken to be similar to the correlation of human sound wave production with mechanical sound wave recording. Recognition of this similarity may be requested on the ground that each correlation in some way subsumes human speech.[5]

2.2 Under certain circumstances the data and methods now represented by articulatory and acoustical phonetics may be compared for optimum efficiency in the discovery and description of facts about human speech. An approach to these circumstances may be made by proposing contrasts in procedural and interpretative limitation as they may hypothetically apply to the activities of scientists. Let H = the heuristic linguist, NH = the non-heuristic linguist. H1.

[2] To a certain extent, in standard physiology and neurology textbooks.

[3] K. L. Pike has published one such index (Phonetics, Ann Arbor, Michigan, 1943, Part II). His formulas for successive articulator function (pp. 154–6) are particularly relevant here.

[4] Cf. Martin Joos, Acoustic Phonetics, Lg. Monograph 23 (1948), and R. K. Potter, G. A. Kopp, and H. C. Green, Visible Speech, New York, 1947.

[5] Independent of efforts to correlate articulator positions with acoustical features.

discovers or approximates discovery of discoverable real phenomena in an absolute[6] field of phenomena: NH1. identifies postulated observables (units ± relationships), by means of identification techniques; H2. needs contrast feature ~ features (± of prescribed type) in real phenomena for setting up each taxonomic difference: NH2. may establish differences as positions in numerical series, or as contrast potentials;[7] H3. may propound an ethic to control the omission or non-omission of data in a presentation (e.g. colleagues may tax a researcher for "not playing fair," "begging the question," "misrepresenting the facts"): NH3. may omit or include data according to technical considerations (± tradition ~ protocol criteria in scientific communication, which may be regarded as technical considerations).

Truex and Kellner, then, is a compendium of observables (stated statically according to one compendium technique) which the linguist may employ in identifying certain units. Observables are discovered or are identified. Acoustical phonetics and articulatory phonetics each provides a series of observables. But the heuristic linguist may judge between the two series, as to which most fully (~ subtly) discovers (~ illuminates) the facts of human speech production. The non-heuristic linguist may not so judge.

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[6] Absolute because it is assumed that ultimate discovery would coincide with existent limits on reality (just as infinity may be figured as a progressive seriation of finite limits); not relative unless relativity (in this context) imply a temporary position of ambiguity on the road to ultimate discovery. (In a logical context, relativity may be taken to imply a variability of elements according to (stated) formulable ~ not yet formulated principles; absolutism may imply the postulated integrity of a formulation—with no reference to formulables.)

[7] Thus units which do not contrast according to one set of criteria may be labelled contrasting in anticipation of another (perhaps not yet stated) set of criteria in terms of which the units will predictably (& necessarily) contrast. E. g. 2, 2, 2 in $1 + 1 = 2, 3 - 1 = 2, \sqrt{4} = 2$ are non-contrasting by a criterion of simple numerical identity; they contrast, as 2^1, 2^2, 2^3, when each 2 is taken to include the process according to which it occurs: 2^1 is an addition-derived unit, series-similar to 3 in $2 + 1 = 3$ (but not to 3 in $4 - 1 = 3$, which is a subtraction-derived unit), etc. By this principle all identicals are viewed as automatically splitting into n occurrences, with n potential contrasts among them. See R.Ruggles Gates, Human Ancestry, Cambridge, Mass., 1948, for a case in point. Gates attacks Dobzhansky for identifying biological species according to non-traditional taxonomic criteria. Dobzhansky's criteria do not square with the history of genetic taxonomies—or they violate Gates's principle that: "Species should be founded primarily on morphological differences." (393 fn.) Gates objects to the identification of species on the basis of intersterility alone, when specimens are morphologically nearly identical. But Dobzhansky performs an operation (implements techniques) and may state, viz.: resultant differences of a stated type constitute species differences, or: resultant similarities (~ identicalities) constitute species differences by a principle of anticipated criteria. Thus Dobzhansky may be interpreted: 1. as proposing new criteria for the identification of species, or 2. as implementing certain techniques, the resultants of which are labelled species. So also with homonymous morphemes in linguistics, where phonemic identicality may: 1. identify a single morpheme, independent of range of distribution, or 2. indicate seriate contrastiveness, when distributions are complementary according to (sometimes overlapping) distribution classes, or when meaning features become contrast criteria, or when morpheme alternants vary accordingly as morphemes are identified morphologically or syntactically. Note further that objections to T. D. Lysenko's weighting of environment as a factor in genetic mutation may seem less cogent if his statements are regarded as relevant to taxonomic techniques rather than to any discovery of truth. See his: Agrobiologia, Moscow, 1948. A forensic statement: "When you begin to look for the reasons behind the mutability of the genotype, then the geneticists explain with one voice: here the matter is clear—the change takes place because the organism mutates. Translated into Russian this means that the organism changes because a change takes place." (pp. 150–1).

REVISTA DO MUSEU PAULISTA. Nova serie, volume 1. São Paulo, 1947. 232p.

This new anthropological journal, of which the first volume was published as a unit,

with title and contents pages, in paper covers, is introduced by Sérgio Buarque de Holanda, director of the São Paulo Museum (Museu Paulista), in a two-page statement (9–10) under the same title as the journal. The old series, established in 1895, started as an all-inclusive publication, treating archeology, botany, paleontology, zoology, and Brazilian history. As time went on, zoology, archeology, and ethnology became the main interests of the Museum and its publication. In 1917, with a new director, a historian, the Museum broadened its interests in that direction, and a historical journal, *Anais* [Annals] *do Museu Paulista* was established in 1922. The *Revista* then became almost exclusively zoological and ethnological (with some Americanist linguistics), botany having acquired a separate organization in 1927; in 1939 a reorganization of the zoology department created the *Arquivos de Zoologia do Estado de São Paulo*, with *Revista do Museu Paulista* as a subtitle; after three years the subtitle disappeared. In 1946 a section of ethnology was created, and this made it possible to revive the old title for the new journal, and to restrict its interest to anthropology—archeology, physical anthropology, ethnology, linguistics (meaning, as so often with us, the linguistics of the native languages, while the linguistics of Portuguese and other languages "of civilization" remains in the non-scientific limbo of the humanities). The *Revista* is edited by Herbert Baldus, chief of the ethnology section of the Museum.

The first volume contains the following articles: four, all in Spanish, by Max Schmidt: Los Bakairí, 11–58; Los Kayapó de Matto Grosso, 59–60; Los Waurá, 61–4; Los Tamainde-Nambikuara, 65–74; then follow: H. Baldus and Aniela Ginsberg: Aplicação do psico-diagnóstico de Rorschach a índios Kaingang, 75–106; Egon Schaden: Fragmentos de mitologia kayuá, 107–24; C. H. de Goeje: Anansi, l'araignée rusée [in French], 125–6; F. A. Bayerlein: Dificuldades de um censo entre índios, 127–8; Emílio Willems: Çontribuição para o estudo antropométrico dos índios Tereno, 129–52; Ettore Biocca, Afonso Hoge, and Giorgio Schreiber: Contribuição ao estudo de alguns sambaquís da ilha de Santo Amaro (Estado de São Paulo), 153–72; Donald Pierson and C. B. Texeira: "Survey" de Pecinguaba, 173–80; C. B. Schmidt: Alguns aspectos da pesca no litoral paulista, 181–212; Silveira Bueno and J. Philipson: Debate sôbre o plural dos entnônimos, 213–22; Registro bibliográfico, 223–32. M. Schmidt's articles are accompanied by 24 plates between pp. 74–5—23, with a map and 56 photographs, on the Bacairí and their material culture, and one with one photograph each on the Cayapó and the Tamainde-Nambicuara; following Biocca, Hoge, and Schreiber's article are 29 plates, with 42 photographs and two maps; and C. B. Schmidt's article is followed by 19 plates, with 38 photographs. The volume is well and accurately printed, though the quality of the paper (except that of the plates) and the selection of type faces leave something to be desired. The lack of linguistic nationalism, with its readiness to print articles in Spanish and French (and, one supposes, in English), and to give French and English summaries (see below), is also to be greatly commended in these days.

M. Schmidt gives (45–58) a vocabulary (476 items) and other linguistic data (a song and two small texts) for the Bacairí originally from the Culisehu river, who moved to Simões Lopes on the Paranatinga (14° S, 55° W—in Mato Grosso), collected from them there by him in 1927. The vocabulary is compared item for item with one collected by K. von den Steinen from the Bacairí of the Paranatinga and published in 1892. Unfortunately, the linguistic techniques exhibited by Schmidt show no improvement over those of 35 years earlier, and one is left little wiser as to the nature of the two obviously closely related dialects. A vocabulary of the Uaurá is also given (62–4), again in comparison with von den Steinen's materials, which, though presumably of the same lan-

guage, show wide differences from Schmidt's 119 items. The Tamainde vocabulary (66–73) of several hundred items (numbered 1 to 610, but with many numbers omitted) is compared with Tauite and Tagnani, somewhat different-appearing Nambicuara languages.

Baldus and Ginsberg give French and English summaries (104, 105); their results seem to the reviewer to be most inconclusive. Schaden gives a number of texts in Portuguese, with comments on each; no native text is given. De Goeje gives English and Portuguese summaries (126) of his brief discussion of the Cunning Spider, the trickster hero of Surinam Negro folklore. Biocca, Hoge, and Schreiber have English and French summaries (169, 170); the *sambaquís* are mounds of shells, stones, etc., apparently man-made.

Silveira Bueno and Philipson argue over the use of plural -s on the names of native tribes in Brazil. A note by H. Baldus at the head of the discussion indicates that tribe names which are not of Portuguese origin are to be kept unchanged in the plural in the *Revista* in accordance with "the international convention of ethnologists," and that the article consists of an exchange of letters occasioned by Silveira Bueno's observations in the section "Questões de Português" in the newspaper *Folha da Manhã* of September 8, 1946. S. B. objected to plurals without -s, considering them in violation of Portuguese grammar. Philipson answered by citing numerous Portuguese authors who used the plurals without -s, as well as French and English usage. In S. B.'s reply, he cites Malinowski's English usage and Sapir's; he contends that the supposed ethnological convention cited by P. has no validity in the face of the much older convention of Portuguese usage. P. replies at length, pointing out that many sciences establish special linguistic conventions: he points out that S. B.'s slighting remarks about Sapir are wholly uncalled for, emphasizing Sapir's greatness as a linguist. As for the linguistic point involved, obviously Philipson has the better of the argument: usage, especially in technical language, determines grammar, and not the other way round.

This is not the place for comment on the ethnological and other non-linguistic material in the volume, except to say that it seems generally competent, though largely in the manner of the old-fashioned ethnographies. It is to be hoped that the quality of the linguistic material will improve in subsequent issues; good descriptive data on Brazilian languages are urgently needed.

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LINGUISTIC AND CULTURAL CHANGE. By Harry Hoijer. Language 24.335–45 (1948).

THE IMPORTANCE OF LANGUAGE UNIVERSALS. Burt W. and Ethel G. Aginsky. Word 4.168–72 (1948).

THE GIFT OF TONGUES. By Clyde Kluckhohn. Mirror for Man. The Relation of Anthropology to Modern Life. Chapter 8 (pp. 145–67). New York, Toronto: Whittlesey House, McGraw-Hill Book Company, Inc., 1949.

AN IMPORTANT CHEYENNE MANUSCRIPT. By F. W. H[odge]. The Masterkey 22.137–8 (1948).

AMERICAN NAMES. A GUIDE TO THE ORIGIN OF PLACE NAMES IN THE UNITED STATES. By Henry Gannett. Washington, D. C.: Public Affairs Press. N. d. [1948]. Pp. 334.

TAOS, NEW MEXICO. By Ina Sizer Cassidy. Western Folklore 8.60–2 (1949).

THE DICTIONARY OF CALIFORNIA LAND NAMES. By Phil Towsend Hanna. Los Angeles: The Automobile Club of Southern California. 1946, Pp. XXI + 360.

THE COYOTE'S NAME IN HUMAN SPEECH. By J. Frank Dobie. The New Mexico Quarterly Review 18.195–9 (1948).

LOANWORDS IN CENTRAL AMERICAN CARIB. By Douglas Taylor. Word 4.187–95 (1948).

THE TEPEHUAN, AND THE OTHER ABORIGINES OF THE MEXICAN SIERRA MADRE OCCIDENTAL. By J. Alden Mason. America Indigena 8.289–300 (1948).

CHRISTIAN MAYA PROPHECIES FROM THE TIZIMIN MANUSCRIPT. By Maud W. Makemson. SJA 4.397–405 (1948).

sapo'teko. By R. Kingdon. lə mɛ:tre fənetik No. 90, pp. 24–5 (1948).

THE KINGDOM OF CHIMOR. By John Howland Rowe. Acta Americana 6.26–59 (1948)

The two problems which Hoijer tackles here are: is it possible to show that linguistic change, as a whole, is a part of the vaster pattern of cultural change; and through what particular mechanisms is language integrated into the rest of culture. The argument is illustrated with reference to the following American Indian languages: Apachean, Athapascan, Chiricahua, Keresan, Kiowa, Kiowa-Apache, Na-Dene, Navaho, Salishan, Shoshonean, Tanoan, Tewan, Tsimshian, Wakashan, Zunian.

In 1933, Bloomfield wrote: "The only useful generalizations about language are inductive generalizations. Features which we think ought to be universal may be absent from the very next language that becomes accessible. . . . The fact that some features are, at any rate, widespread, is worthy of notice and calls for an explanation; when we have adequate data about many languages, we shall have to return to the problem of general grammar and to explain these similarities and divergences, but this study, when it comes, will not be speculative but inductive."[1] Fifteen years have passed, and the Aginskys conclude that universals among languages "are far more numerous than suspected." However, they do not present any inventory here: their article calls attention merely to the scientific importance of such a study, which they expect to enlarge upon later. They give a handful of examples of phonemic types, morphological techniques, and semantic categories, which they call universal. They also outline possible applications for more effective communication, based on a thorough knowledge of language universals. A well-known attempt in this direction was made already over a decade ago by N. S. Trubetzkoy.[2]

Kluckhohn's always readable and often eloquent unfolding of the several branches of anthropology, presented here "not for the carping professional," but for the layman, as a scientific basis upon which variant value systems may be reconciled and groups of human can bring themselves to live together in peace, includes a chapter on language also. Taking for its title the miraculous gift in the early Church, "The Gift of Tongues,"[3] the discussion revolves principally around two topics, which are ultimately interconnected. The author gives a series of anecdotes designed to demonstrate that translation from one language into another is extremely difficult; and then goes on to show that "a language is, in a sense, a philosophy."[4] Thus, like so many scholars who work in fields marginal to linguistics, Kluckhohn conceives of language as essentially a function of something else: of culture,

[1] Language, p. 20. A partial list—75 items—of elements common to all known cultures—appears in George Peter Murdock, The Common Denominator of Cultures, *in* The Science of Man in the World Crisis, ed. Ralph Linton, p. 124. Murdock's list includes language, and a few linguistic items, such as kinship nomenclature and numerals.

[2] Wie soll das Lautsystem einer künstlichen internationalen Hilfssprache beschaffen sein? TCLP 8.5-21 (1939). Trubetzkoy refers to about 200 languages in his Grundzüge der Phonologie, TCLP 7 (1939), about the same number that Bloomfield cites in his Language.

[3] Margaret Schlauch selected the same title for her popular book (Modern Age Books, New York, 1942).

[4] Kluckhohn illustrated this from Navaho in an earlier book (cf. IJAL 14.278, [1948]). The argument along these lines may be used to bolster a startlingly opposite implication from that intended by Sapir, Whorf, or Kluckhohn. Cf. Leo Weisgerber, Sprache und Begriffsbilgund, Actes du quatrième congrès international de linguistes, pp. 33–40 (Copenhague, 1938).

in this instance. It would be absurd to deny that language does play a role as a function of physiology, psychology, or ethnology; but modern linguistics, while acknowledging these external relations, regards language as essentially an autonomous entity of internal relationships, that is, as a structure.[5] Linguistic structure, by hypothesis, may be regarded as a legitimate object of scientific research; this is the characteristic viewpoint of an increasing number of linguists the world over. This also is the point characteristically neglected in popular expositions on language.

A certain Ben Clarke—about whom Hodge gives some biographical information—could speak Cheyenne fluently, and wrote a dictionary and grammar of this language for General Sheridan. The manuscript was never published, but its existence was known to Pilling, who mentions it, though did not himself see it. It now lies in the Southwest Museum, and contains a total of 395 pp., including a typewritten grammar, a vocabulary, and a section here referred to as "philology."

Gannett's book was originally issued in 1905, under a slightly different title, as a bulletin of the U. S. Geological Survey. There is no attempt at revision, and the work remains now merely of antiquarian interest. Quite a few of the entries are traced to Indian sources, but the reliability of these etymologies must be judged in terms of information and techniques current nearly half a century ago. Many an unsuspecting reader may well raise an eyebrow at the absence of any declaration within the pages of the book that this is not a new publication, but merely the reprint of one quite out of date.

The discussion concerning Taos is written by the president of The New Mexican Folklore Society, and is a sample from a dictionary of New Mexico place names which this organization has in preparation. Taos is here said to be a Tiwa word.

The bibliography of works dealing with California place names is considerable. Kroeber, already in 1916, has written about those of Indian origin.[6] Hanna's labor of love brings together much scattered material in several thousands of entries, and also includes a comprehensive list of relevant books, pamphlets, periodicals, manuscripts, and maps: thus he may be said to have compiled a useful and reliable reference work. The Indian element seems considerable; for example, 13 out of 58 California counties bear names that are here traced to Indian origins; some of them are: Klamath, Modoc, Napa (Pomo?), Shasta, Siskiyou (Cree?), Sonoma, Tehama (Wintun), Tuolumne (Miwok? Yokuts?), Yolo (Patwin), and Yuba Maidu). Of the remaining, 34 county names are derived from Spanish, and only 11 from English or other languages.

The Spaniards adopted the word coyote from the Aztec coyotl; the word was taken over into English by 1830, in place of 'prairie wolf.' In modern Mexican, coyote is a term applied to human character and activity in a variety of situations surveyed here by Dobie.

The earliest records of men's language among the Island Carib show strong influence from the women's language, presumed to be an Aruak dialect. Only a few minor differences between the two still survive, most of the basic forms in the language of both sexes being those originally of the women's. Taylor studies the Post-Conquest borrowings from Spanish, French, and English, giving representative sample lists which illustrate the phonetic shifts of various types and periods.

[5] Cf. Harris, Lg. 16.223 (1940): "It is important to recognize that language is a system of units and their relations, because that often serves as our criterion of what material is language and what is not." See also, H. J. Pos, Perspectives du structuralisme, TCLP 8.71-8 (1949); Viggo Brøndal, Linguistique structurale, Essais du linguistique générale (Copenhague, 1943), pp. 90–7; and especially Louis Hjelmslev, Editorial, Acta Linguistica 4.V–XI (1944).

[6] UCPAAE 12, No. 2.

Mason's paper deals mainly with the ethnography of the Southern Tepehuan, including especially "mitote," secular celebrations, participation in which constitutes a main distinguishing characteristic between an Indian with and one without tribal affinity. The four main groups of natives still inhabitating Sierra Madre are Tarahumar, Tepehuan, Cora, and Huichol. These are all Uto-Aztecan languages, and belong to the Taracahitian substock,[7] Tarahumar to Tarahumaran, Cora and Huichol to Coran, and Tepehuan—both Southern and Northern, together with Tepecano, to Type A of the Piman group. Mason says here, however, that Southern Tepehuan and Tepecano "are only dialectically different" and that the relation between the former and Papago (which Whorf places under Type B with Upper Pima and Lower Pima) seems to be closer than between Northern and Southern Tepehuan.

Makemson offers the original Maya text, with English translation by herself and Louis Howe Evans, of two pages of material from the so-called Book of Chilam Balam of Tizimin, dated not earlier, and not much later than 1629. The text consists of a table of twenty-eight entries relating to the Spanish days of the week, the names of the celestial bodies which rule over them, and, in a third parallel column, predictions as to the expected quantity of the maize crop in the different annual cycles. This table is followed by seven brief prophecies, and these by four short paragraphs only one of which is connected with the preceding matter.

Kingdon presents a version of a Zapoteco text, The North Wind and the Sun. [ðə tra:ns'kripʃn iz "not fu'ni:mik] but follows the principles of IPA.

Rowe's main objective is to outline the culture history of Chimor on the North Coast of Peru. Though not relying on techniques properly belonging to linguistics, yet the exposition contains scattered philological comments. The use of the source materials in part involves philological research, and the argument here and there (e.g., pp. 37–8) may even be labelled textual criticism. A few surviving kinship terms are also given (p. 48). Since the Indian language is lost—Rowe calls it "perhaps the most powerful instrument for self-protection that an Indian group can have"—absorption of the native villages into the generalized mestizo or creole culture may be expected.

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[7] B. L. Whorf, *in* Essays in Anthropology Presented to A. L. Kroeber . . . (Berkeley, 1936), pp. 197 f.

BIBLIOGRAPHY OF INDIAN FOLKLORE TEXTS IN LATIN AMERICA: 1948

Cadogan, León. Las tradiciones religiosas de los indios jeguaká tenondé porá-gué í del Guairá, comunmente llamados mbyá, mbyá-apyteré o ka'ynguá. Revista de la Sociedad científica del Paraguay (Asunción) 1946, VII, no. 1, p. 15–47. Mbyá texts, with Spanish translation and vocabulary, of creation and flood myths, with various other traditional narratives told in Spanish only, with some passages in the original text, and notes. Also Mbyá text and Spanish translation of a healing prayer.

Elson, Ben. The Homshuk: a Sierra Popoluca text. Tlalocan, a journal of source materials on the native cultures of Mexico (La casa de Tlaloc, Azcapotzalco, D.F., Mexico) 1947, II, 193–214. Popoluca phonetic text, with literal English and free Spanish translations, from Ocotal Chico, in southern Veracruz, Mexico, about the adventures of Homshuk, the Popoluca corn god, explaining the origin of corn, of bad animals and insects, of how the deer got its horns, the rabbit its long ears, the frog its bumpy skin, etc.

Foster, Mary L. and George M. Sierra Popoluca speech. Washington, D. C., U. S. government printing office 1948. 45 p.

(Smithsonian institution. Institute of social anthropology. Pub. no. 8.) Describes the phonology, morphology, syntax, vocabulary, and foreign influence, of this Indian speech of Veracruz, Mexico, and gives a specimen text, a witch story, with translation and analysis.

Oropeza Castro, Manuel. El diluvio totonaco. Tlalocan, a journal of source materials on the native cultures of Mexico (La casa de Tlaloc, Azcapotzalco, D.F., Mexico) 1947, II, 269–275. Totonac text and vivid Spanish translation, preserving the flavor of the original, of a very interesting version of the flood myth and other folk narrative motives.

Schmidt, Max. Los bakairí. Revista do Museu paulista (São Paulo, Brasil) 1947, n.s. I, p. 11–58. Historical and cultural description of these Brasilian Indians around Simões Lopes, to supplement and bring up to date the data on them in Karl von den Steinen's *Unter den Naturvölkern Zentral-Brasiliens*, including two linguistic texts with Spanish translation and miscellaneous data of folklore interest.

Tschopik, jr., Harry. Aymara texts: Lupaca dialect. International journal of American lingustics 1948, XIV, 108–114. Aymara texts, with literal and free English translations, of three folktales and a legend, collected by the author in Chucuito, Puno, Peru.

Warkentin, Milton and Olivares, Juan. "The holy bells" and other Huave legends. Tlalocan, a journal of source materials on the native cultures of Mexico (La casa de Tlaloc, Azcapotzalco, D.F., Mexico) 1947, II, 223–234. Huave phonetic texts, with both literal and free English translations, from San Mateo del Mar, Oaxaca, Mexico, of legendary narratives of early Huave history.

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